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The Concept of a Planning Region†

By JOHN R. P. FRIEDMANN*

I

WITH few exceptions, public planning activities are delimited and organized in space. The region, the county, the metropolitan area, and the city are usually considered to be the basic units for planning.

In the present essay we shall be primarily concerned with the functional relation between the two main forms of areal planning, between city and regional planning. Theoretically, there should be little to distinguish one from the other. In both cases the major problem is the same: how to bring the physical environment in which men live under the controlling influence of the public interest. In practice, however, city and regional planning in the United States have proceeded along diverging paths.

To explain this lack of unity we would have to go far into the historical origins of planning in this country—a task too ambitious for the present essay.[1] But the basic distinction between city and regional planning appears when we consider it as primarily a difference in *controls* available to local and federal government for guarding the public interest.

In the cities, planning has evolved largely as an effort to maintain existing rental values and to improve the circulation of people and the flow of goods.[2] Zoning, subdivision control, and the powers of eminent domain are among its principal and most effective tools. Occasionally, too, city planners are charged with the preparation of capital improvement budgets, and the planning function has been extended to problems of internal growth and development. In most cities, however, the predominant concern is still with the present. Only peripheral attention seems to be given to a comprehensive approach which would determine the "needs" of the community ten, twenty, or even fifty years ahead and would proceed to show how these "needs"

† The writer is indebted to Drs. Harvey S. Perloff and Harold M. Mayer, both of the University of Chicago, for many helpful comments and suggestions during an earlier formulation of this essay. He wishes also to express his gratitude to Professor Floyd A. Stilgenbauer for permission to reproduce the map of population changes in the United States, 1940 to 1950.

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[1] For an excellent and comprehensive summary, cf. R. G. Tugwell and E. C. Banfield, "Governmental Planning at Mid-Century," *The Journal of Politics*, XIII (1951), p. 133-163.

[2] Robert B. Mitchell and Chester Rapkin, *Urban Traffic: A Function of Land Use* (New York: Columbia University Press, 1954).

might best be met in the present. Rarely is the community offered a choice to consider what kind of a future it would have. The element of *design* in planning is almost totally lacking, and the evolution of life in the community is left by default to the haphazard interaction of private interests.

Regional planning, on the other hand, has grown up under quite different circumstances.[3] "Regional planning," wrote the National Resources Committee in 1935, "should, in the main, confine itself to dealing with the physical resources and equipment out of which socio-economic progress arises."[4] By this definition, regional planning has two main foci of interest: physical resources and their development. But the control powers of the federal government were so restricted that its point of entry into regional planning was the field of water resources where it had primary jurisdiction. Through the development of water resources for a multiplicity of uses it was hoped that social and economic advance in the watershed would be furthered.[5] The watershed, therefore, became rapidly identified as the "proper" region for planning, and the recognition that land resources are intimately rerelated to the use of water only strengthened this view. Whether it was called the Tennessee Valley, the Columbia Basin, the Missouri Valley, the Central Valley, or the Arkansas-Red River Valleys, the physical setting was always a major drainage basin organized for comprehensive resource development. Flood control; the development of facilities for navigation, electric power, irrigation, and recreation; stream sanitation; erosion control and reforestration; even mineral development came to be included under development schemes in major river basins.[6]

The best known and certainly the most advanced regional planning agency in the United States is the Tennessee Valley Authority. Elsewhere in the United States a more complex scheme for regional planning has been worked out which involves a multiplicity of federal agencies such as the Bureau of Reclamation, the Corps of Engineers, the Soil Conservation Service, and the Forest Service; and, to an increasing extent, state and local organizations. In every instance, however, administration is found to be organized along regional (watershed) lines.

The contrast between city and regional planning which we have attempted to sketch may be summarized by saying that city planning has been primarily concerned with community conservation through land use planning and control while the purpose of planning for regions has been economic progress through the development of natural resources. What Catherine Bauer calls an "iron curtain" has descended between city and resources planners.[7] Two different professions, two different vocabularies have grown up. Communication between them has become exceedingly difficult, and on the level of practical action there appears to

[3] In the present context, metropolitan planning will be treated as a form of city planning. This coincides with the view expressed by Benton MacKaye and Lewis Mumford in their article on "Regional Planning" which first appeared in the 14th edition of the *Encyclopedia Britannica* in 1929.

[4] National Resources Committee, *Regional Factors in National Planning* (Washington: U. S. Government Printing Office, 1935), p. 156.

[5] For example, Gordon Clapp, shortly before his resignation as Chairman of the Board of TVA wrote: "Those who urged the enactment of the TVA Act apparently believed that, if the Tennessee River were conquered and its water power harnessed, the river would help transform the economic life of the region and increase the productive capacity of the nation. Nothing less than the resources of the United States Government could cope with this task." *TVA: An Approach to Regional Development* (Chicago: The University of Chicago Press, 1955), p. 14.

[6] President's Water Resources Policy Commission, *A Water Policy for the American People*, Vol. I (Washington: U.S. Government Printing Office, 1950).

[7] Catherine Bauer, "Economic Progress and Living Conditions," *The Town Planning Review*, January 1954, p. 303.

be little coordination between schemes of regional and urban development.

Now, coordination is no absolute value. It becomes valuable only where it furthers a particular objective. Thus, we may well ask whether regional planning as currently organized can achieve the end of sustained economic progress without taking explicitly into account the existence of urban centers and whether city planning in its present form can effectively achieve *its* purposes while ignoring the larger regional framework within which the city has to function. These questions have not as yet received adequate attention.

II

The concept of the region as a tool for planning had its origin in the Great Depression. There had been forerunners, of course, such as the Regional Planning Number of the *Survey Graphic* in 1925,[8] and the writings of Benton MacKaye[9] but, as late as 1934, Hedwig Hintze could write in the *Encyclopedia of the Social Sciences* that "in the United States regionalism has never really appeared."[10] To be sure, there existed many examples of metropolitan planning in New York, Boston, Washington, Chicago, Los Angeles and several of the other large American cities but, as we shall see, the "new regionalism" explicitly rejected the metropolitan area as a logical unit for planning.

The new philosophy took hold especially in the South where planning came to be looked upon as the truly dynamic aspect of regionalism.[11] It was an essential particle of the regionalist's fate that planning would provide the means toward the "rehabilitation of the people, toward the reconstruction of regional economy, toward increasing the region's revenue to the nation as well as its own wealth, and toward general regional, cultural adjustment."[12] The South saw in regional planning an opportunity to halt the decline of its resources and its people and to achieve what came to be vaguely referred to as "regional balance," while yet maintaining its unique agrarian culture and tradition. Whether there was not, indeed, a conflict among these objectives is a question that was not apparently considered.

The writers primarily responsible for elaborating on this concept of the planning region were teaching at Southern universities.[13] And the South, in their view, was indeed the archetype of a "true" region. It was identified with a distinctive "folk culture," the region being "an expression of the folk who occupy it and who give it a distinctive character through their 'natural' extra-organized, extra-technological, and unrationalized ways of life."[14] Folk culture, no doubt, was the cohesive bond that held a region together. But it was not sufficient for a definition. The region was also a distinctive area because it possessed "the largest possible degree of homogeneity measured by the largest possible number of economic, cultural, administrative, and functional indices, for the largest possible number of objectives."[15] Clearly, only a rural economy could, by any stretch of the imagination,

[8] *Survey Graphic*, May 1925.

[9] Benton MacKaye, *The New Exploration: A Philosophy of Regional Planning* (New York: Harcourt, Brace and Co., 1928).

[10] In the article on "Regionalism."

[11] Howard W. Odum and Harry Estill Moore, *American Regionalism* (New York: Henry Holt and Co., 1938), p. 253.

[12] *Ibid.*, p. 254.

[13] Howard W. Odum, "The Case for Regional National Social Planning," *Social Forces*, October 1934, pp. 6-23; Rupert B. Vance, "Implications of the Concept 'Region and Regional Planning'," *Publication of the American Sociological Society*, August 1935, pp. 85-93; T. J. Woofter, Jr., "Southern Population and Social Planning," *Social Forces*, October 1935, pp. 16-22; Harry E. Moore, *What Is Regionalism* (Chapel Hill: The University of North Carolina Press, 1937); John V. Van Sickle, *Planning for the South* (Nashville, Tenn.: Vanderbilt University Press, 1943).

[14] Moore, *op. cit.*, p. 13.

[15] Odum and Moore, *op. cit.*, p. 272.

be considered sufficiently "homogeneous" to qualify as a region. Though urbanization had made progress in the South, it had not yet drawn the focus of regional interest upon itself.[16]

An imagery of rural values still prevailed in the 1930's.[17] Perhaps the most amazing document of the times is a collection of essays written by twelve Southern writers in which the issue was unambiguously posed: agrarian versus industrial society.[18] These essays turned into a vigorous defense of the "Southern way of life," of traditionalism against what the authors called the "American or prevailing way," against progressivism. Industry must never come to the South in large numbers; the South was to remain a separate cultural enclave, a sanctuary of leisurely culture in the "European" sense.[19] And when a few years later TVA set about to develop the great hydro-electric potential of the Tennessee River, even *Fortune* magazine in an otherwise sympathetic article expressed grave doubts that all of the energy produced by federal dams could ever be sold to industrial consumers.[20]

Economic betterment in the South could be accomplished only by over-all planning—that, at least, was the current belief. *Laissez-faire* as a solution to the difficulties confronting the South was rejected as "futile and cruel."[21] The New Deal provided the impetus for planning. And the homogeneous, natural region seemed to be ideally suited to the comprehensive planning approach. No one, it might be added, seemed to be especially surprised by this strange wedding between Southern rural conservatism (region) and Northern progressivism (planning).[22]

The National Resources Committee which sponsored an extensive study of the region for planning tried to avoid some of the pitfalls of the ideological approach taken by its Southern proponents. "Regional planning," the Committee stated, "is not an end in itself; rather it is an instrument for arranging certain things more successfully. It is a basis for action. It is a means for deriving sensible policies and programs, and it should be an aid in determining what kinds of devices are most suited to carrying out these policies and programs."[23] But the ideology was in the air; it was pervasive, and it entered as an unconscious bias into the thinking of the Committee when it rejected the concept of the region based upon metropolitan influence:

"To construct regions which would adhere to cities rather than to the broader aspects of resources, economic patterns and regional interests is to place the emphasis upon one factor rather than the total region. Upon such a basis, regional planning tends to become an expanded form of city planning. On the other hand, it is by no means certain that planning has not arisen at least in part out of necessity of preserving local rural culture and resources against chaotic economic and social forces emanating from the city. Even were cities themselves carefully planned, this would still be true, for the city is an organism whose very nature places its nutritive processes above larger regional considerations."[24]

[16] Walter J. Matherly, "The Urban Development of the South," *The Southern Economic Journal*, February 1935, pp. 3-26. For more recent evidence, cf. Rupert B. Vance and Nicholas J. Demerath (eds.), *Urban South* (Chapel Hill, N. C.: Univ. Press, 1955).

[17] A dawning recognition that the rural way of life in the South might be in the process of being swallowed by progressive urbanization is found in Van Sickle, *op. cit.*, pp. 76 ff. Van Sickle wrote his book at the crest of the wartime wave of expansion of industry in 1943.

[18] Twelve Southerners, *I'll Take My Stand* (New York: Harper and Brothers, 1930).

[19] *Ibid.*, p. 3.

[20] "TVA: Federal Power," *Fortune*, May 1935, pp. 156-160.

[21] Van Sickle, *op. cit.*, p. ix.

[22] That planning had struck its roots in the urban reformist movement during the early part of this century and that its methods and techniques were carried over into the national scene during the New Deal has been strikingly demonstrated by Rexford G. Tugwell in "The Sources of New Deal Reformism," *Ethics*, July 1954, pp. 249-276.

[23] National Resources Committee, *op. cit.*, p. 167.

[24] *Ibid.*, p. 159.

This was in 1935. In 1938, Lewis Mumford published his brilliant study on *The Culture of Cities*.[25] While generally sympathetic to the Southern exponents of regional planning, he could not—and would not—escape the basic fact that it was the city which gave a region its cultural vitality. Like his Southern brothers-in-arms, he thought he recognized the region as a "natural area." But, he added, "to define human areas, one must seek, not the periphery alone but the center."[26] The city was thus a fact of the utmost geographic importance "for the urban center tends to focus the flow of energies, men, and goods that passes through a region, concentrating them, dispersing them, diverting them, rerouting them, in short, exerting a close and controlling influence over the development of region as a dynamic reality."[27] The city was viewed as analogous to the heart of the body: a controlling mechanism which pumps the life blood of energy, people, and commerce to all parts of the regional organism.

Shortly after the appearance of Mumford's book came the war, and with it began the sudden and startling rejuvenation of the American economy. Already by 1942 there were signs that the wind had shifted: the city was beginning to make an impression on the consciousness of the nation. In a challenging article, Louis Wirth proposed the metropolitan region as a planning unit.[28] That a restatement of the principles of metropolitan planning was necessary at this time only emphasizes the pervasive influence which the Southern School of regionalists had had on the spatial organization of planning. Wirth proposed that the immediate area constituting the region should be the area of daily intimate and vital interrelation between the city, its suburbs, and periphery and, further, that the region should be a unit "which takes account of the city's and its surrounding area's place in the national and world economy."[29]

Toward the end of the war there appeared a sharply critical article which attacked what it recognized as the rural traditionalist bias of regionalism on the grounds that it had failed to do justice to the facts of the technological revolution that was remaking America. "Regionalism," wrote Kollmorgen, "runs counter to the technological aspects of society which are universal and dominant and will eventually prevail over discordant folkways which regionalists may try to perpetuate."[30] Urbanism, to Kollmorgen, was the "wave of the future" that would sweep everything before its onrushing advance.

But the rural values propounded by the regionalists derived from a hardy stock and would not die so easily. Two years after Kollmorgen's incisive critique, and already well into the postwar era, a group of Yale University social scientists and planners resurrected the imagery of a natural region with its foundation in folk culture.[31] This time, however, the regionalists went beyond the traditional requirements of "geographic unities" and "homogeneous desires, attitudes, and wants," and suggested a forceful analogy of the region with individual living

[25] Lewis Mumford, *The Culture of Cities* (New York: Harcourt, Brace and Co., 1938).

[26] *Ibid.*, p. 315.

[27] *Ibid.*

[28] Louis Wirth, "The Metropolitan Region as a Planning Unit," *National Conference on Planning*, Proceedings of the Conference Held at Indianapolis, Indiana, May 25-27, 1942 (Chicago: American Society of Planning Officials, 1942), pp. 141-151.

[29] *Ibid.*, p. 150.

[30] Walter M. Kollmorgen, "Crucial Deficiencies of Regionalism," *American Economic Review*, Papers and Proceedings, May 1945, p. 377.

[31] Yale University, *The Case for Regional Planning*, With Special Reference to New England (New Haven: Yale University Press, 1947).

organisms.[32] Living in one of the most urbanized, industrial "regions" in the United States, the authors of the Yale Report searched for a regional philosophy that would somehow conform to their urban experience. In "biologism" they found an adequate basis for their beliefs by which they could challenge the mechanistic aspects of an urban society which they at once accepted and opposed. In this, they came very close to Lewis Mumford's own interpretation a decade earlier.

The Yale Report was perhaps the last outburst of the regional planning ideology in this country. But it did not mean the end of regional research as such. Since 1947 a number of regional studies have been published which continue the long line of such studies first begun by the National Resources Planning Board in the 1930's. The *Economy of the South*, sponsored by the United States Council of Economic Advisers, was one of these and a typical example of the difficulties that the older regionalists encountered.[33] The study included 13 Southern states, chosen on the basis of a "certain homogeneity in geography, population, climate, income, and history," but especially because each of these states was felt to be vitally concerned "in the production of one or both of the two great cash crops which dominate the agriculture of the region, cotton and tobacco."[34] But no sooner had they stated it, than the authors of the Report retracted this inclusive definition. "In fact," they continue, "the problem of homogeneity arises almost as soon as more than one State is included if, indeed, it does not arise within the borders of a single State."[35] From a rigorous, scientific viewpoint a definition of the region according to homogeneous factors seemed rather a shaky one in 1949.

A second important regional study dealt with the New England economy.[36] But here the problem of definition appeared in even a more striking form. While purporting to deal with the whole of the "region," the report is actually preoccupied with southern New England, to the relative neglect of rural Maine, Vermont, and northern New Hampshire. Although in their statistics the authors were compelled to admit the basic north-south distinction inherent in the human geography of the region, they described New England elsewhere as an "old industrial community," But surely this is no more than half of the story. The "region" turns out, in fact, to be two, divided among an even greater number of metropolitan spheres of influence.

The very ambiguity of both these reports regarding the nature of their "regions" suggests that the old conceptions had become of doubtful value. A new regional order and a new kind of planning appeared in the making, an order based on "interdependence" instead of a spurious homogeneity. And again it was Louis Wirth who spoke out for the new concept.[37] In such a region, he wrote, "the component parts are not necessarily similar or identical but stand in a relationship of significant interdependence or integration of life in one or more respects. Such a region finds difficulty in delineating its boundaries, but is more likely to have a salient or dominant center . . . ."[38] His article helped to clear the way to a view of regional

[32] *Ibid.*, p. 36.
[33] Joint Committee on the Economic Report, (Washington: U. S. Government Printing Office, 1949).
[34] *Op. cit.*, p. 1.
[35] *Ibid.*
[36] U. S. Council of Economic Advisers, *The New England Economy* (Washington, U. S. Government Printing Office, 1951).
[37] Louis Wirth, "The Limitations of Regionalism," *Regionalism in America*, edited by Merrill Jensen, (Madison, Wisconsin: The University of Wisconsin Press, 1951), pp. 381-393.
[38] *Ibid.*, p. 383.

planning that would be in greater accordance with the facts of economic development. To an elaboration of this view we shall now proceed.

III

It was primarily through the efforts of the Chicago school of sociologists during the 1930's—building on the pathbreaking work of McKenzie—that the concept of the metropolitan region as the logical unit for planning was developed and refined.[39] Concurrently with these studies at Chicago, the German geographer, Walter Christaller, suggested that any inhabited area would exhibit a certain structure of settlement which may be read as a hierarchy of central places standing in a mutually dependent relationship to each other.[40] The validity of Christaller's rigid geometrical pattern of central places has been variously questioned.[41] Its main influence, however, was to provide a new perspective on regionalism and regional structure. To the attentive reader it suggested an approach which by-passed the old problem of delineating homogeneous "folk-regions."

The first major advance beyond these pre-war researches was achieved in this country by Donald Bogue, who provided large-scale empirical evidence for the theory of metropolitan dominance advanced by McKenzie and offered aggregate measurements of metropolitan regional structure.[42] The next step in the development of metropolitan theory soon followed with an attempt to bring together the theories of regional structure as a system of central places(Christaller) and of metropolitan structure (Bogue). Rutledge Vining of the University of Virginia, in a highly stimulating paper, proposed to view the human landscape as an "inter-connected system of central places."[43] Vining appeared to be strongly influenced in his theory by certain traffic flow maps he had seen for the United States. Indeed, his maps seemed clearly to indicate an hierarchical pattern of cities that transcended any "regional" boundaries and presented instead a picture of economic "flows" of different densities, joining one city to another.

This novel view of the "region," in effect, dispensed with the traditional regional concept altogether. Rather, it pictured a *system of cities* having certain properties of stability, though individual units within the system might always be shifting.[44] Considerable support for this view can be found in the long-run trends of the American economy.

An ever-increasing proportion of the total population lives today in cities or on the periphery of cities. According to Bogue, 57 percent of the population in 1950 lived in the 162 metropolitan areas defined by the Census, and the proprotion continues to rise with each year.[45] Shift of population from rural to urban-metropolitan areas implicit in these figures is excellently portrayed in the

[39] Roderick D. McKenzie, *The Metropolitan Community* (New York: McGraw-Hill Book Co., Inc., 1935). Indeed, metropolitan regionalism in 1951 was not a new phenomenon; but it was now new in its more or less self-couscious opposition to the Southern regional school.

[40] Walter Christaller, *Die Zentralen Orte in Sueddeutschland* (Jena: Gustav Fischer Verlag, 1933). See also the discussion of Christaller's theory in Robert E. Dickinson's *City Region and Regionalism* (London: Kegan Paul, Trench, Trubner and Co., 1947); for a more recent critical review, Rutledge Vining, "A Description of Certain Spatial Aspects of an Economic System," *Economic Development and Cultural Change*, January 1955, pp. 160-165.

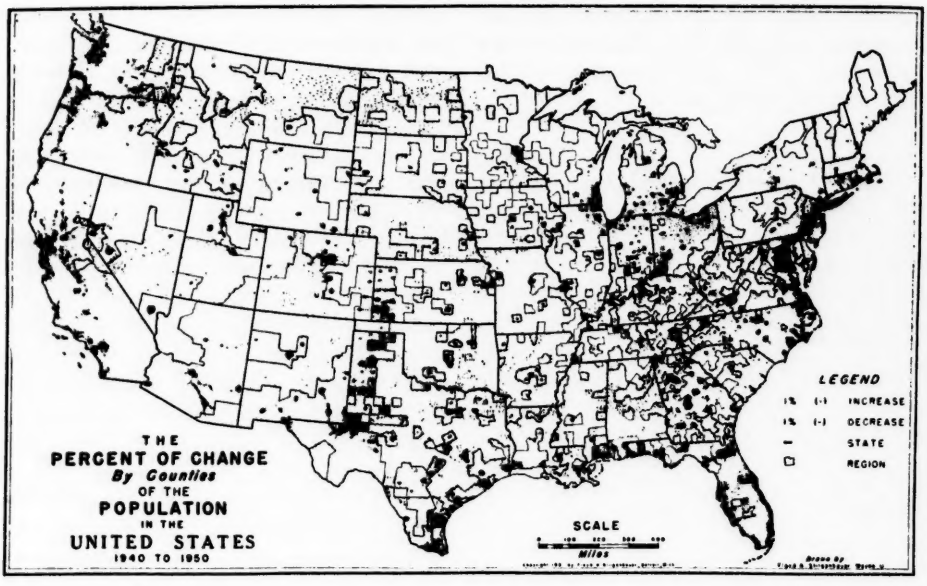
[41] The most recent example is Vining, *op. cit.*, pp. 164-5. Also August Loesch, *The Economics of Location* (New Haven: Yale University Press, 1954), p. 433.

[42] Don J. Bogue, *The Structure of the Metropolitan Community* (Ann Arbor, Michigan: Horace H. Rackham School of Graduate Studies, University of Michigan, 1950).

[43] Rutledge Vining, "Delimitation of Economic Areas: Statistical Conceptions of the Spatial Structure of an Economic System," *Journal of the American Statistical Association*, March 1953, pp. 44-64.

[44] Vining, "A Description of Certain Spatial Aspects . . .," *op. cit.*, p. 185.

[45] Donald J. Bogue, *Population Growth in Standard Metropolitan Areas, 1900-1950*, (Washington: Housing and Home Finance Agency, 1953), p. vii.



accompanying map: population appears to move into clusters around a relatively small number of central places, and most of the rural countryside is becoming rapidly depopulated. Much of this growth during the past two decades occurred within the "rings" of metropolitan areas, however, rather than in central cities.[46] A rough picture of this important trend may be got by comparing the growth rates of urban and rural non-farm populations during recent decades. Between 1930 and 1950 urban population in the United States increased by 30 percent, contrasted with a 64 percent gain in the rural non-farm sector.[47] Most of this gain was in the suburbs.

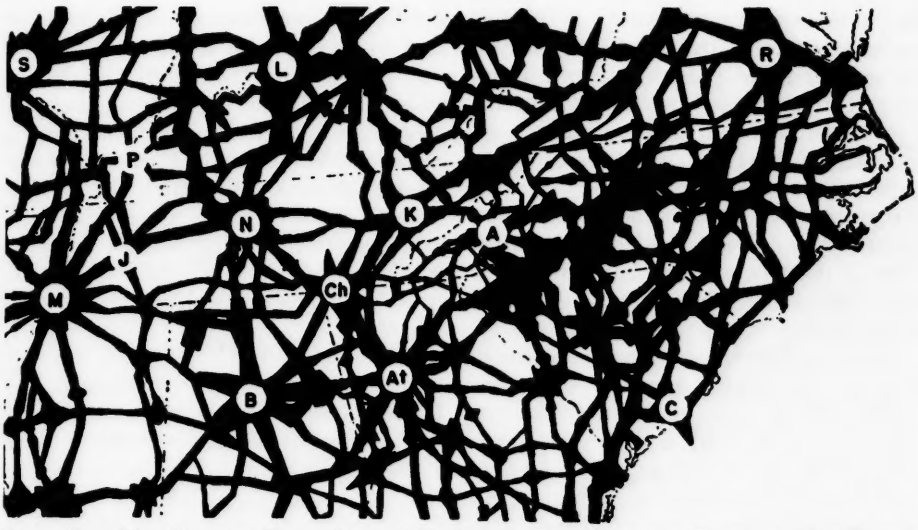
With a high concentration of population in cities and in the areas peripheral to them, central places also gained relatively in economic power. Transport and communications systems came increasingly to focus on the dominant cities. The traffic flow map reveals the striking instance of "nodality" in the flow of the economy.

Population growth centering around cities must be viewed in the context of the upheaving changes in the American economy which have led to a progressive reduction of employment in farming and to a corresponding increase of opportunities in manufacturing and other sources of employment. The full development of a system of cities is related to economic changes and the particular pattern to which it conforms is dependent on the stage of economic maturity which the economy has reached. With rapid industrialization, new non-farm jobs tend to become available at a faster rate in the larger cities of an area than elsewhere.[48] And income changes, on the whole, parallel this movement of jobs to the

[46] *Ibid.*, p. 18.

[47] *U. S. Census of Population*, 1930, 1940, and 1950. To insure comparability of data, the old Census definitions of "urban" and "rural non-farm" were used for 1950.

[48] John R. P. Friedmann, *The Spatial Structure of Economic Development in the Tennessee Valley*, Research Paper No. 1, Program of Education and Research in Planning (The University of Chicago, March 1955), chaps. II and III.



TRAFFIC FLOW MAP, SOUTHEAST UNITED STATES, 1952: AVERAGE DAILY VOLUME OF TRAFFIC ON MAIN ROUTES, WITH LINES PROPORTIONAL TO DENSITY OF TRAFFIC. *Source:* UNITED STATES DEPARTMENT OF COMMERCE. BUREAU OF PUBLIC ROADS.

LEGEND **A** Asheville **At** Atlanta **B** Birmingham **C** Charleston **Ch** Chattanooga **J** Jackson **K** Knoxville **L** Louisville **M** Memphis **N** Nashville **P** Paducah **R** Richmond **S** St. Louis

large cities.[49] Economic development seems, indeed, to act in such a way as to enhance the possibilities of further growth at central places.[50] Not only does industrialization tend to improve the accessibility of an area by encouraging the provision of a wider variety of transportation services in the center, but it creates its own markets, tends to tip the balance of available capital for investment in favor of the city, and contribute to the progressive specialization of the labor force.[51] And once a pattern of urban settlement is established, its basic structure tends to perpetuate itself.

As the larger cities become more heterogeneous, the smaller cities and communities within their sphere of influence become functionally more specialized. Some grow into "satellites" of the center, others into specialized service, industrial or market cities. While the center of economic power in this pattern is the metropolis, all the communities within its economic reach are mutually dependent upon one another and upon the metropolitan center in its turn.[52]

The emerging pattern of the economy —what Lampard calls its metropolitan phase[53]—is thus built up increasingly around the *city region* with its dense urban core, its less densely populated outer "ring" (population declining outward toward the periphery of this "ring" along the major routes of access), and

[49] *Ibid.*, chap. V.

[50] *Ibid.*, chap. VI.

[51] *Ibid.*, pp. 31-36.

[52] The metropolitan center is itself related to other centers and, according to Vining, occupies a place in the hierarchy of cities within the national system as a whole. What we have attempted to describe in the preceding pages is only the growth of one of the sub-systems within the larger system for the nation.

[53] Eric E. Lampard, "The History of Cities in the Economically Advanced Areas," *Economic Development and Cultural Change*, January 1955, p. 102.

its satellite communities.[54] With increasing industrialization the conditions for further rapid growth in city regions tend to improve, and the "links" between and among city regions—in terms of population flows and the flows of goods and communications—tend to be strengthened. There is increasing interdependency throughout, and the structure of the whole economy tends to become more precisely defined along functional lines.

If this description of the spatial structure of a developing economy is substantially correct, we conclude that the city region has, in fact, become the basic areal unit for carrying out comprehensive developmental planning below the national level. It is a region defined by an intricate pattern of economic and social interdependencies; it is, therefore, a "community" informed of certain common interests; and above all, the locus of socio-economic power for a broader geographic area.

The basic requirement for the existence of a city region is transportation. Modern transportation facilities permit the outer "ring" to extend outward from the city core for about one hour's driving distance along major highways and connecting tributary roads.[55] Rapid transportation makes possible the ingathering of materials (e.g., lumber) from within this "ring" as well as the distribution of goods to outlying points of consumption. And it enables individuals to commute freely to most places of employment within the city region which, in turn, permits a more rational ordering of residential, industrial, commercial, and recreational areas. Accessible and rapid transportation is the means by which the various sections of the city region are welded together into a unified whole; modern transportation, in fact, has made the city region at all possible.

IV

In the past, regional planning in the United States has dealt primarily with the problem of resource development as a means for improving the economic welfare of people, while city planning has been mainly concerned with problems of land use control and circulation. Now we may argue that both of these functions—development and control—should be brought together in a common framework and that the logical framework for this purpose is the city region.

The focus of economic development is thus shifted from a broader territorial basis and an emphasis on *natural* resources to the city region and an emphasis on *metropolitan* resources, such as transportation, space, and community organization. Given this focus, planning for the city region should proceed along two parallel courses of action: (1) in the direction of developing metropolitan resources with a view to encouraging general economic prosperity; and (2) in the direction of controlling land use so as to create a pleasing, no less than an efficient, environment for living. Thus conceived, the planning function should extend across the entire area dominated by the central city.

The resources of most city regions in the United States are far from being fully developed. Yet the socio-economic reality of city regions will not be wholly

[54] The term "city region" is preferred to "metropolitan region" because the concept is meant to apply also to cities which are smaller than those defined by the Census as "metropolitan." According to the Census, the population minimum for the central city of a standard metropolitan area is 50,000. "City region," as here defined, may be areas with a central urban core of about 30,000 population. The parallel British term would be "town region."

[55] Friedmann, *op. cit.*, p. 67. Cf. also Frank G. Coolsen *et al.*, *Paducah and Western Kentucky:* Income, Labor, and Retail Trade Patterns (Frankfort, Ky.: The Agricultural and Industrial Development Board of Kentucky, 1952); and Robert N. Gold, *Manufacturing Structure and Pattern of the South-Bend-Mishawaka Area* (Research Paper No. 36, Department of Geography, The University of Chicago, June 1954).

attained until its resources have been brought to optimum productive levels.

Transportation is perhaps the most strategic of these sources where it unfolds the locational advantages of the city region. It allows for accessibility to the center and for rapid circulation among the various parts of the city region. Speaking in metaphor, we may say that transportation is the "nervous system" of a regional organism and is absolutely vital to its survival. It will influence both the structure and the efficient functioning of the city region as a center of economic development. Robert B. Mitchell, in the foreword to a study of accessibility in southeastern Pennsylvania, writes much in the same vein:

"Our 20th century technology makes possible a close and rapid contact among all parts of a great metropolitan area. Distance need be measured no longer by miles, but by minutes and convenience. This is the one most powerful fact in shaping the nature and arrangement of the various metropolitan localities. The potential of each locality is largely determined by its accessibility to other parts of the region. In turn the prosperity of the region as a whole will be very much affected by the quality of its internal circulation system."[56]

In improved internal transportation, Mitchell sees a way to "maximize opportunities for the good life and for prosperity in the Region."[57]

Second in importance only to transportation, are the space resources of the region. It is true that both transportation and space have traditionally been recognized as areas central to the concerns of city planners, but they have seldom been looked upon as *resources* which may be *developed* to assist in the economic growth of a "region."

Space is always in limited supply, modified as it is by its location, physical attributes, and the extent of man-made improvements on the land. It would be a radical mistake to believe that useful or "economic" space in the area surrounding a central city is co-extensive with the total number of square miles of this area, simply because this area does not as yet appear to be densely settled. The techniques of land use planning, subdivision control, and zoning are becoming quite as necessary in the less inhabited areas of a region as within the crowded urban core itself.[58]

A third important resource of the city region is found in the organization of its community life. As the city proper is itself often composed of different "neighborhoods," and as these join with one another in the polity of city life, so does the city region form a "community" which is composed of a number of interrelated parts: the urban core, industrial "satellites," "suburban" residential areas, village communities, and areas reserved for recreation and agricultural use. The economic integration of the city region will be expressed through the proper planning of its transportation and space resources, but it must be reflected in the social integration of the city region as well. Social integration sets limits to the possible economic integration of regional life. No part of the city region can fully develop its potentialities except within this larger regional framework. Functional differentiation compels the component parts of the region to strive for closer mutual ties and always greater interaction. It is the development of the city region as a truly urban *community* which assures to each component part its special advantages and resources.

[56] The Southeastern Pennsylvania Regional Planning Commission, *Time-Distance* (Bridgeport, Pa., 1954).

[57] *Ibid.*

[58] The consequences of ignoring these problems are vividly stated by Karl Belsen in his "Misuse of Land in Fringe Areas and Inadequate Subdivision Standards," *Problems of Decentralization in Metropolitan Areas*, Department of City and Regional Planning, University of California, 1954. (Mimeographed).

V

The basic spatial relations in an economy are found (1) between a central city and its surrounding region and (2) between one city region and another. The first type of relationship and its significance for planning has been described in the foregoing section. The second type of relationship has greater relevancy for national planning. Differences in the level of economic development among larger socio-economic "regions," such as those defined by the Census, are gradually disappearing in the United States.[59] A truly *national* economy is emerging, with individual "regions," in the old sense, gradually losing their claims to special federal attention. Regional criteria of "need" are no longer as determining to policy as criteria derived from purely national "needs".

Not only are the old regional differences in the United States disappearing, but most of the more densely settled parts of the country may eventually come within the influence of city regions. The landscape will be overlaid with a network of such regions, one region joined to the other. Donald Bogue came to a similar conclusion when he wrote:

> "In the not too distant future . . . . the number of metropolitan centers may increase to such an extent that 65 miles will be the maximum distance which most areas lie from a central city, and technological improvements in transportation may permit all communities within this radius to participate directly with the metropolis."[60]

If this hypothesis is correct, and already it seems to hold true for large sections of the country, attention in national planning will have to shift increasingly to the relations *among* city regions. Transportation assumes a major role in defining these relations, and the current high pitch of interest in express highways is indicative of this trend.

In addition to planning for the city region and inter-regional relations, special resource problems may arise from time to time which call for a different areal organization than the one we have emphasized in this essay. In the case of power, water, or recreation resources, to cite some prominent examples, development may be organized on the basis of "functional" regions. Such a region may consist of an integral number of city regions grouped together for the purpose of planning a single function. In view of the interlinked pattern of city regions emerging in the more densely populated parts of the country, this particular form of regional organization is one likely to be followed. There are other possibilities, of course, where a functional region such as a watershed would cut across city regional boundaries or where several states would join in the solution of a mutual problem. But even here, the fact that city regions exist will loom large in planning considerations.

Although as much as 90 percent of the total population of the country may eventually reside within city regions, there will be large areas of sparsely settled land that fall outside the immediate influence of central cities. Such areas as the Cumberland Plateau, the Blue Ridge Mountains, the Ozarks, the Great Lakes cut-over regions, parts of northern New England, and large sections of the Southwest and West fall in this category. They pose special planning problems due to the poverty of their populations and their limited resources. An extensive type of development through recreation, forestry, or grazing will often form the basic approach to these areas.

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[59] Charles A. R. Wardwell, *Regional Trends in the United States Economy* (Washington: U. S. Government Printing Office, 1951), especially Chap I.

[60] Bogue, *The Structure of the Metropolitan Community*, *op. cit.*, p. 55.

They are regions characterized by special physical disadvantage for a more intensive development. They may be called "functional regions" when public policy addresses itself specifically to problems related to the development of their resources. However, the name is unimportant. What is important is the recognition that special problems beset these areas; that they fall outside the existing pattern of city regions and thus outside the main stream of economic progress; and that only a small proportion of the country's population will reside in them.

Apart from these special areas, the United States economy maintains a definite spatial structure expressed in the pattern formed by city regions, and functional planning will usually be carried out successfully where it is closely related to this pattern, point for point. City regions are the nerve centers of economic life in an area. They are the seats of economic power where most of the population is concentrated, where most of the vital decisions affecting larger areas are made, and where the financial means are present for carrying these decisions into action. Any planning which ignores this primary fact about the spatial structure of an economy must be judged unrealistic.

Capital Costs of Private vs. Public Power for AEC†

By JOHN V. KRUTILLA* *and* JOHN M. PETERSON**

THE tremendous growth in power needs of the Atomic Energy Commission recently has renewed public interest in the private vs. public power issue. By 1956 AEC will require about 50 billion kilowatt-hours of electric energy annually—approximately a third of the total volume of energy purchased annually for the entire United States economy prior to World War II. From its inception, AEC has relied on the federally-owned power system in the Tennessee Valley to fill a large part of its demand for dependable, low-cost powers. Consequently, the rapid growth in AEC's power requirements has been accompanied by rapid growth in the federal facilities serving it. However, since 1950 AEC also has obtained part of its increased power needs from combines of privately-owned utility companies formed for this specific purpose.

Since virtually all of the hydroelectric potential of the Tennessee Valley has been developed, TVA has been meeting AEC's increased requirements with large-scale steam electric plants. The same type of power facilities are being built by private utility combines to meet AEC's needs. With private and public enterprise building comparable facilities to serve the same type of power loads, an opportunity is afforded to compare costs under private and public ownership without the usual complications introduced by joint-cost allocations of multiple-purpose hydro facilities, different proportions of hydro and steam generation, and differences in power market characteristics.

Despite the comparable conditions governing both private and public operations in this instance, the private combines have encountered difficulty in attempts to meet the government's own costs in providing the power requirements of AEC. The basic sources of this difficulty must be correctly analyzed if public policy is to be guided by this experience.

Part of the private combines' difficulty in meeting the government's costs lies in the higher capital costs incurred by private than by public enterprise. Because capital costs may account for as much as half of the total cost of power, a difference in capital cost has a significant effect on the difference in total costs to the government under private or public enterprise. The nature and reasons for differences in private and public capital costs need to be understood before the problem can be fully appreciated.

Part of the difficulty lies in the tax payments required of a private company but not usually required of a federal agency. Taxes required of privately-owned power operations, however, will account for only a portion of the difference between private and public power costs. Part of the difficulty may lie in the comparative efficiency of management. There is a popular tendency to assume superior efficiency under private management, and to disregard the perform-

† This paper was originally prepared for presentation at the 1954 annual meetings of the Southern Economic Association, while the authors were employees of Tennessee Valley Authority. It was not made public at that time, however, since the authors feared it might be interpreted as entering the Dixon-Yates controversy. With the exception of one footnote, no change has been made in the paper which was based on published information available as of mid-1954. The views expressed are those of the authors and should not be considered as representing the views of the Tennessee Valley Authority. The authors are indebted to William Dean, John Lopez, and Charles Stephenson for their many helpful comments on an earlier draft of the paper. Any shortcomings which remain, however, should be attributed solely to the authors.

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ance records of federal agencies. Nevertheless, an analysis of comparative efficiency is not attempted in this paper because valid generalizations on such a factor can hardly be made on the basis of particular examples of management quality and technical competence.

The purpose of this paper, therefore, will be to analyze the capital components of the total cost to government for providing AEC power from private and public facilities, taking into account tax and risk elements. Differences in returns on investment and amortization of debt will be considered in terms of their cost to the federal government, disregarding inter-agency charges within the government. The extent to which tax receipts by the government counteract or reinforce these differences will be considered first by including and then by netting out all taxes relevant to both private and public operations. Finally, the incidence of losses or gains contingent upon future events will be considered in order to evaluate further the differences in the nature of private and public operations.

Hypothetical models will be employed throughout the discussion in order to illustrate general factors without describing the complex variations in technical conditions and contract terms among specific actual cases. The models, nevertheless, incorporate representative features of AEC's contracts with its private and public power suppliers.[1]

[1] The terms of AEC's contracts with Electric Energy, Inc. (EEI) serving its plant at Paducah, Kentucky, with Ohio Valley Electric Corporation (OVEC) serving its plant near Portsmouth, Ohio, and with TVA serving both Oak Ridge and Paducah plants are reflected in the following: (1) Philip Sporn and V. M. Marquis, "The OVEC Project," a paper presented at annual meeting of American Institute of Electrical Engineers, November 1953; (2) U. S. Congress, Senate, *First Independent Offices Appropriations, 1954, Hearings . . . . 83rd Congress . . . . on HR 4663* (Washington: Government Printing Office, 1953), pp. 30-46. Similar arrangements, with modifications, proposed by Messrs. Dixon and Yates for the Mississippi Valley Generating Company are reflected in Senate debate printed in the *Congressional Record* for July 13, 1954, pp. 9938-9948, and for July 21, 1954, pp. 10749-10753.

Gross Capital Costs to Government

AEC's choice between a privately-owned or federally-owned power plant for its power source may be viewed as a choice between alternative ways of obtaining from private investors the capital funds necessary to build power facilities. Private utility companies will issue securities to private investors. It may be assumed that the federal power agency will rely on the sale of Treasury securities —also to private investors.[2] *In either case the cost of providing this capital will be paid by AEC over a period of years through the rates charged for power, and ultimately by the Nation's taxpayers through tax revenues supporting AEC's operating budget.* Because the earnings necessary to attract capital are influenced by federal taxes applicable to returns on the capital as well as state and local taxes on property values, it is convenient, initially, to take explicit account of taxes in considering capital costs. For this purpose, then, gross capital costs to government may be regarded as consisting of: (1) an annual return on investment, (2) an annual capital recovery charge, and (3) federal, state, and local taxes.

The Hypothetical Models. To observe how these components of capital cost behave under alternative ownership arrangements, a power operation may be postulated with identical physical characteristics for a private utility combine and a federal power agency. In both models the power operation will be assumed to require capital funds amounting to $100 million, of which $95 million will be required for fixed capital and $5 million for working capital and invento-

[2] Economic analysis of government investment requires imputing an annual interest as a cost of sacrificing present for future consumption alternatives. Regardless of whether funds for a particular project are raised initially from taxes or borrowing (assuming this can be ascertained), an assumption that funds were borrowed through sale of Treasury securities provides the best basis for analysis of economic costs and for comparison with private operations.

ries. The facilities are considered to have a useful life of 35 years, but AEC is assumed to contract for the total output of the power operation for only 25 years. Thereafter, AEC has the option to renew the contract for an additional 10-year period. AEC is assumed to guarantee that, in the event it cancels the contract, it will pay all fixed capital charges during a specified notice period and thereafter will pay a termination charge. The later cancellation occurs in the contract period, the smaller the cancellation charge will be. The notice period and cancellation charges are calculated to insure AEC payment of fixed costs on idle capacity until estimated alternative demand, projected from past trends, develops sufficiently to use the full capacity of the plant.

These contract terms, which are of the general pattern used by AEC, eliminate almost all normal business risks of failure to recover fixed capital and to earn expected returns due to retarded growth, cyclical fluctuations, or unexpected declines in demand. The virtual elimination of these risks has an important bearing on the methods available for financing the operation and, in turn, on capital costs. The expected capital costs during the 25-year contract period will be examined first, leaving for separate analysis the incidence of contingent losses or gains for shorter or longer periods.

Returns on Investment. The prospective earnings required by a private company to obtain new capital will depend on the proportion of debt and equity securities issued and the rates of return required to attract buyers for each type of security. The typical electric utility company raises about half of its capital requirements through bonds and other long-term debt instruments. With the other half of its capital provided by equity requiring relatively high earnings, the typical private utility is unable to offer attractive rates to AEC.

An unusual capital structure permitting substantial economies in financing, however, is being used by the private utility combines contracting with AEC. The financial guarantees provided in AEC's contracts for power enable these combines to obtain 95 percent of their capital from the sale of bonds. The low proportion of risk capital reduces the proportion of the capital on which relatively high returns are required and reduces the amount of profit as compared with a typical private utility of equivalent investment. The bonds for financing of this character have been sold to insurance firms at interest rates averaging little more than 3.5 percent. The equity capital, subscribed to exclusively by utility companies participating in the combine, is virtually guaranteed by AEC contracts to earn 8 percent annually after taxes.[3]

A federal power agency may be assumed to raise its capital entirely through Treasury borrowing from private investors. The effective cost of borrowing by the federal government is represented by the average interest rate on all types of Treasury securities held by the public, because a large part of the public debt is customarily refinanced through the issue of short-term securities at lower interest rates than on its long-term bonds. This average interest rate has varied from 2.2 to 2.44 percent during the last four years of rapid AEC expansion.[4] Nevertheless, to facilitate computing, 2.5 percent, a widely used rule-of-thumb figure, will be assumed in this paper.

Federal policy on the power rates charged AEC as well as other customers

[3] A 9-percent return has been proposed for MVGC.

[4] U. S. Treasury Department, *Annual Report of the Secretary of the Treasury*, for the Fiscal Year Ended June 30, 1953, p. 471.

by a federal power agency may require a margin of returns on investment in excess of the effective interest cost of Treasury borrowing.[5] Such a margin may be ignored in considering costs to the government, however, since it involves only an intra-government transaction.

Accordingly, the returns on investment required under private and government ownership will differ as a result of the private utilities having both (1) a higher rate of interest on borrowed capital, and (2) a relatively high rate of return on risk capital. The total returns on investment over the 25-year contract period for the assumed models will be approximately $59,105,000 for the private combine and $46,661,000 for the federal agency, a difference of over $12 million.

TABLE I—RETURNS TO INVESTORS OVER 25-YEAR PERIOD UNDER PRIVATE AND PUBLIC POWER CONTRACTS WITH AEC

Power Source	*Investment*	*Returns to Investors Over 25 Yrs.*
PRIVATE COMBINE		
Bonds (@ 3.5% interest)	$ 95,000,000	$ 49,105,000
Stocks (@ 8% earnings after taxes)	5,000,000	10,000,000
		$ 59,105,000
FEDERAL POWER AGENCY		
Treasury Securities (@ 2.5% interest)	$100,000,000	$ 46,661,000

Amortization of Fixed Capital. The original investment in fixed assets must be recovered by the end of their useful life, and this is a capital cost that also must be included in the rates to customers. It might be assumed that this cost would be the same whether the plant is owned by a private company or a federal agency, but that is not necessarily the case. Differences result from the fact that in some cases AEC may be required to pay for all of the original investment in fixed assets during the 25-year life of the contract; in other cases the amortization period may extend beyond the life of the contract so that customers other than AEC may repay part of the fixed investment.

Conventional practice is to include in the charge for power an allowance for depreciation sufficient to recover the original cost of the fixed properties during their useful life. The rate practice between AEC and the private combines, however, has been to exclude depreciation, as such. Instead, an allowance is included to retire the bonds issued by the utilities; equity capital is not retired. This practice is convenient since the amount of bonds issued by the private combines coincides approximately with the amount of investment in fixed properties subject to the usual depreciation charges. The equity capital approximates the investment in property not subject to depreciation which can be liquidated when operations cease, such as cash, inventories, and the land on which facilities are built. However, because the bonds may be issued for a period of 25 years (the period of the contract with AEC) this procedure requires AEC to repay the principal during

[5] For example, TVA has earned about 4 percent on its average investment after full allowance for annual depreciation, or more than enough to cover an imputed interest cost on invested funds.

a period which is shorter than the 35 years the facilities may be expected to be useful, as would be the case under conventional depreciation. When repayment is completed, at the end of the contract period, the equity owners retain title to the income earning asset whose net worth greatly exceeds their investment.[6]

In contrast, the time period chosen to amortize the investment by a federal agency will not affect the real cost to the government as a whole. The initial investment yields an economic service over its entire useful life, and the annual investment recovery cost is governed by the same period since title to the asset remains with the government. Annual costs to the government, therefore, will be smaller than amortization payments based on the 25-year contract period. These lesser annual costs will be incurred by the government during the period in which AEC is served; thereafter, they will be borne by subsequent customers who will be served by the facilities.

In short, while the private utilities will recover fully their fixed investment in the 25-year contract period, at a cost to the government of $95 million, the capital recovery cost to the government, if served by a federal power agency, will amount to only $59 million over a comparable period.[7] The shorter write-off period thus reduces the risk to the private utilities, but increases the cost to the government—$36 million over a 25-year period.

Taxes. Taxes on both the private combine and on holders of private and public securities must enter into cost comparisons of private and public operations serving AEC. While security holders will pay taxes out of their returns, the private combine must pay taxes in addition to returns to its investors. Separate analysis of the tax receipts by the federal government, which must be considered in determining the net cost to the government, will be facilitated by including at this stage all taxes that must be recovered by A E C's rates.

The present rates of federal tax on corporate income of private utilities are 30 percent on the first $25,000 of income and 52 percent thereafter. In the private power model, the effective rate would be 51.46 percent, given the rate of return after taxes permitted by AEC contract terms. Assuming these tax rates will be applicable over the entire 25-year period of the contract, accumulated federal income taxes to be paid by the private combine will aggregate $10.6 million.

State and local taxes to be paid by the private combine contracting with AEC will reflect the rates and property assessment practices of the particular state and locality, following an initial adjustment period. A sudden large increase in the property tax base of a rural county due to location of a large industrial plant usually results in a downward readjustment of tax rates. In view of this, state and local taxes payable annually by private utilities contracting with AEC are estimated to range between 1.0 and 1.5 percent of original fixed investment, or somewhat lower than average rates paid by the private electric utilities in the United States.[8] Assuming that about 1.5 percent of original investment will be required, state and local tax payments by the private combine would amount to about $35.6 million over the 25-year period.

[6] The same principle applies to the 30-year amortization period proposed for MVGC.

[7] In both cases annual capital charges are assumed to be met by equal annual payments sufficient to repay investment in fixed assets and interest on outstanding debt over the amortization period.

[8] Since this paper was written, official estimates have been released indicating lower state and local taxes as a percent of plant investment: 0.42 percent for OVEC, 0.65 percent for EEI, and 1.40 percent for MVGC—or an average of 0.64 percent (see pages 893-5, *Hearings before the Joint Committee on Atomic Energy on the Exercise of Statutory Requirements under Section 164*, November 1954).

Although it is public policy under certain circumstances to make in-lieu-of-tax payments by agencies of the federal government to state and local governments,[9] under the traditional doctrine of intergovernmental tax immunity, property of the federal government is not taxable by state and local governments. Since the steam plant in this case would be built to serve another federal agency, no state nor local taxes would be incurred by the federal power agency.

To summarize, when the returns to investment, capital recovery charges, federal taxes, and state and local taxes are summed over the 25-year period for the two models, the gross cost to the government amounts to about $200 million on AEC power purchased from the private combine, or about $95 million greater than for AEC power obtained from the federal agency.

TABLE II—Gross Capital Costs to the Government for AEC Power from Private and Public Sources

	Private Combine	Federal Agency	Differences
Returns on Investment	$ 59,105,000	$ 46,661,000	$ 12,444,000
Capital Recovery Charges	95,000,000	59,077,000	35,923,000
Federal Corp. Income Taxes	10,600,000	..	10,600,000
State and Local Taxes	35,625,000	..	35,625,000
Total Capital Costs to Government	$200,330,000	$105,738,000	$ 94,592,000

Net Capital Costs to Government

The gross capital costs to the government incurred for AEC's power supply are partly recaptured by the Treasury in the form of taxes. This tax recapture by the Treasury reduces the effective cost to the government and to the taxpayers. The question then arises: When tax payments are taken into account, will net capital costs to government be higher or lower under private than under public ownership? To answer this question, it is essential to take into account the tax recapture on returns to investors in both the private combine and the federal agency as well as the tax recapture from the private combine's receipts as a corporation.

Cost Recapture: Private Combine. The financing methods employed by the private combine result in a relatively low proportion of gross capital costs being recaptured in taxes by the government. In the first place, since only 5 percent of the capital is represented by equity shares, only a small proportion of total returns on investment are subject to the relatively high corporate income tax rates. Secondly, since the stock is held by participating utility companies, only a comparatively small sum can be recaptured through taxes on dividends of the combine. Domestic corporations are permitted an 85 percent credit on dividend receipts from other domestic corporations before computing their corporate income taxes; and a small additional amount is recaptured by individual income taxes on dividends distributed by participating companies. Finally, since 95 percent of the capital is

[9] For example, TVA makes in-lieu-of-tax payments to states and local governments amounting to 5 percent of its revenues from all non-federal customers. During fiscal 1954 these payments amounted to almost $3.6 million. The municipal and cooperative distributors of TVA power paid an additional $5.5 million in state and local taxes.

subscribed to by insurance companies, the bulk of the returns to investors is subject to exceptionally low-income tax rates. Insurance companies are subject to tax rates of only 3.75 percent on the first $200,000 of taxable income and 6.5 percent thereafter. Since certain expenses are deductible from investment income before tax rates apply, federal taxes are estimated to recapture no more than 5 percent of the interest income of insurance companies. These favorable circumstances, stemming from the unusual capital structure of the private combine, restrict the amount of gross capital costs to the government which is recaptured to about 7 percent.

Cost Recapture: Federal Agency. When a federal agency supplies power to AEC, a portion of the interest on Treasury securities also will be recaptured by the government. Private holders of Treasury securities, just as holders of corporate securities, pay federal taxes on interest income. The amount the Treasury recaptures will depend on the distribution of various types of Treasury securities among different classes of security holders and on the average proportion of income recaptured in federal taxes from each class of security holder. Excluding the holdings of federal agencies and trust funds, an estimated 25 percent of the interest on Treasury securities outstanding, as of June 30, 1953, was recaptured in taxes.[10] Applying this rate to the interest charges that must be met on capital advanced for the federal power agency, the Treasury will recapture about 11 percent of the total capital costs of power supplied AEC by the federal power agency.

[10] Distribution of each type of Treasury security among classes of holders estimated from the *Annual Report of the Secretary of Treasury*, for the fiscal year 1953, Tables 116 and 118. Estimates of tax recapture for each class of security holder were based on information from *CCH Federal Tax Guide*, 1954; *Statistics of Income*, 1950; *Federal Reserve Bulletin*, May 1954; and *Life Insurance Fact Book*, 1953.

One qualification bears mentioning. The amount the Treasury will recapture in taxes depends on the constellation of tax rates which obtains at any time. Tax rates prevailing in 1953 were assumed for these illustrative models. These tax rates represent a reasonable basis for comparisons since they have been applied to income from both corporate and federal securities. It must be noted, however, that any reduction in corporate tax rates from their relatively high level during 1953 will result in a relatively larger reduction in tax recapture from the private combine than from the federal agency.

Net Capital Costs to Government. What then can be said about net capital costs to the federal government on power supplied AEC by each of our models? Over the 25-year contract period, AEC will pay the private combine approximately $200 million to cover capital costs of one kind or another. Of this amount the federal government will recapture approximately $2.5 million in taxes on interest earnings from the private combine's bond holders, $10.6 million in corporate profits taxes, and $1.4 million in taxes on dividends. This will leave net capital costs to the federal government of about $187 million, or 93 percent of the gross costs.

In the case of the federal power model, because of the lower interest rate, smaller annual recovery charges, and the omission of any surplus (as an intra-government transaction), a total of about $106 million will represent the gross capital costs over the 25-year period. Of this amount the federal government will recapture about $11.7 million in taxes on interest earnings of Treasury security holders, leaving a net capital cost to the government of $94 million, or 89 percent of the gross cost.

Thus, the net cost to the government from the private combine is about double the net cost from the federal agency. In short, when account is taken of federal taxes in both models, including the tax on interest earnings of Treasury security holders as well as taxes on the private combine and its security holders, the resulting comparison is more favorable to the federal power agency than when federal taxes were not taken into account.

It may be argued as a qualification to this conclusion that state and local taxes covered by AEC rates should be deducted to arrive at the net capital costs *to taxpayers*. Were this argument valid, net capital costs to taxpayers still remain about 60 percent greater from the private combine than from the federal agency. Such an argument, however, may be

TABLE III—RECAPTURE OF CAPITAL COSTS BY THE FEDERAL GOVERNMENT OVER 25-YEAR CONTRACT PERIOD

(25-Year Totals)

	Gross Capital Cost to Govt.	Recapture by Fed. Govt.		Net Capital Cost to Govt.
		Rate	Amount	
Private Utility Combine				
Interest on bonds	$49,105,000[1]	5.0%[2]	$ 2,455,000	$ 46,650,000
Corporate profits	20,600,000[3]	51.46%[4]	10,600,000	8,580,000
(from dividends)		..	1,420,000[5]	
Capital recovery	95,000,000[6]	..	..	95,000,000
State-local taxes	35,625,000[7]	..	..	35,625,000
Total	$200,330,000	7.2%	$14,475,000	$185,855,000
Federal Power Agency				
Interest on Treasury securities	$ 46,661,000[8]	25.0%[9]	$11,665,000	$ 34,996,000
Capital recovery	59,077,000[10]	..	..	59,077,000
Total	$105,738,000	11.0%	$11,665,000	$ 94,073,000
Difference	$ 94,592,000		$ 2,810,000	$ 91,782,000

[1] Interest at 3.5 percent on outstanding obligations, assuming amortization in 25 years.

[2] Maximum normal and surtax rates for insurance companies total 6.5 percent of taxable income; after allowable deductions and the graduated rate are taken care of, a 5% average rate on all interest earnings is assumed to represent a reasonable approximation.

[3] Required gross profits to permit 8 percent annual return to equity after taxes.

[4] Based on normal tax rate of 30 percent on first $25,000 and 52 percent thereafter.

[5] Assumes 75 percent of $10,000,000 net earnings are paid out in dividends to participating companies, which are permitted an 85 percent credit on these dividend receipts from another domestic corporation in computing their taxable income; 51.5 percent of remaining 15 percent of dividends subject to tax amounts to a 7.7 percent, or $578,000, recapture from the participating companies. Assuming in turn that participating companies pay out 75 percent of their net earnings in dividends, an estimated further tax recapture of 16.2%, or $842,000, on dividends (received about 70 percent by individuals and 20 percent by corporations) will result.

[6] Fixed investment fully recovered in 25-year contract period.

[7] Amounts to 1.5 percent of fixed capital annually for 25 years.

[8] Interest at 2.5 percent on outstanding Treasury securities over 25 years, assuming amortization based on 35 equal annual installments.

[9] Based on estimated distribution of all types of Treasury securities among classes of security holders and on the estimated proportion of income paid in taxes by each class of security holder, as of June 30, 1953.

[10] Assumes amortization in 35 equal annual installments, with interest at 2.5 percent of debt outstanding.

subject to question. The tax beneficiaries will be restricted to the localized area near the site of the steam plant, while taxpayers nationally are taxed to provide these payments as a part of national defense. There is, in effect, a geographic redistribution of income amounting to about $36 million from national taxpayers to local tax beneficiaries. There is, furthermore, an inconsistency involved. In choosing the private combine as a power source, AEC incidentally would be electing to make tax payments to state and local governments on power facilities it alone uses, yet it does not make similar tax payments on the much greater investment in the production plants in which the power is used.

Contingent Losses or Gains

Up to this point, the discussion has been based on the assumption of a 25-year contract period. A number of gain or loss possibilities remain to be explored, however, on the alternative assumptions of contract cancellation and /or extension beyond the twenty-fifth year. These contingent losses or gains raise complex questions about the economic costs of providing capital for the private and public models.

Possibilities for Losses or Gain. AEC guarantees payment of specified amounts in the event of contract cancellation by it before the twenty-fifth year. However, there is no absolute certainty that the assumed alternative demand, on which cancellation payments are calculated, will materialize. If growth of alternative power demand should be retarded below presently indicated trends, cancellation charges plus revenues from alternative sales may be inadequate to recover fixed capital and provide expected returns to equity. On the other hand, if alternative demand develops more rapidly than currently anticipated, revenues and cancellation charges may exceed the revenues to have been obtained from sales to AEC. Thus, windfall gains may be possible.

In the case of the private combine, the equity shareholders have this possibility of gain as an offset to their risk of loss. AEC's obligation to meet the cancellation charges is not offset by any potential return to the federal government. In the federal agency model, both cancellation charges and the risk of failure to recover capital due to retarded development of alternative demand, are assumed by the federal government, but the possibility of gains remains as an offset. In short, under the private combine, the federal government assumes a large part of the risk without any possibility of gains, whereas under the federal agency model it will assume all of the risks but these will be offset by the possibility of contingent gains.

If AEC exercises its option to extend the contract an additional ten years, it can be expected to obtain a reduction in annual capital costs from the private combine amounting to the annual sum of capital recovery charges and interest on outstanding obligation ($5.76 million annually). Although all risk of loss on fixed capital will have been extinguished along with the debt, returns to risk capital will continue at 8 percent after taxes. Under these circumstances total gross capital costs to the government over the 35-year period would approximate $223 million for the private combine, or about 51 percent greater than the $148 million for the federal agency model. Deducting federal taxes in both cases, however, would leave net costs to the government still 51 percent greater under the private utility than under the federal power model.

When the 35-year period is considered, however, a difference in time distribution of costs incurred and services received must be reconsidered. In both models, rates charged the government on power will require that fixed investment along with interest on outstanding debt be covered. In the case of power supplied by the private combine, however, these costs are fully met by the government some ten years in advance of services provided. They therefore represent an advance of funds for which the government receives no interest from the private combine but on which it incurs interest costs.

In the event AEC does not exercise its option to renew its contract after 25 years, the government incurs no further costs. If the power is assumed to be obtained from a federal agency, the federal government continues to bear some risk of failing to recoup the unrecovered capital that remains to be amortized during the remaining ten years. The probability that the federal power agency can secure revenues in excess of costs from sales to alternate customers, however, represents a potential gain as an offset against the risk of loss during the remaining ten-year period.

By contrast, the private combine, with its fixed investment fully recovered in 25 years, bears no further risk. In addition, if its revenues from sales to alternative consumers should approximate its previous revenues from sales to AEC, it would gain a windfall amounting to approximately a 64-percent return on equity after taxes.

Quite apart from contingent risks related to cancellation, there are also risks associated with possibilities of increased costs during the 35-year period. Disregarding conceivable differences in management efficiency—assumed to be identical for purposes of this paper—there may be a difference in the incidence of costs through price rises depending on the type of contract negotiated. Under one type of contract, AEC has agreed to meet all increased costs of construction, materials, wages and fuel regardless of whether increased costs were incurred as a result of price inflation or conditions for which management is responsible. Under such a cost-plus contract, the normal operating risks of actual costs departing from estimated costs are borne entirely by AEC rather than by the risk capital shareholders. Of course, price rises for a federal power agency also must be borne by the government but control of costs otherwise is maintained under government management. Thus, the government bears the entire risk of cost increases both under the cost-plus type of contract with a private combine and under a federal agency; but only in the latter case does it retain a measure of control over the costs it incurs.

Premium for Assuming Risk. These contingent losses and gains introduce difficult questions of judgment into the analysis of comparative capital costs for the two models. In an accounting sense, there are no losses or gains until actual events occur, but economic analysis requires imputation of some cost for the risks assumed. Normally this risk premium is reflected in the rates of return which are determined in the security markets as the required inducement for investors to bear the risk associated with each type of investment. The rate of return to the private combine, however, is negotiated to meet a unique situation for which the "market" provides no satisfactory guide as to true risks involved. While a low average rate of return on total investment was achieved by the related circumstances of singular contractual guarantees and a high debt to equity ratio, it is impossible

to determine whether the conventional rates of return on the bonds and stocks were justified by the actual risks involved. Not only are guarantees provided which largely eliminate all risk, but also the limited risks remaining are offset by promising possibilities of windfall gains.

On the other hand, the net rate of return on investment in the federal power model does not reflect the risk which potentially is involved in government as well as private investment. Interest on Treasury securities represents very nearly the pure interest of a riskless investment. While the earnings which may be required of a federal agency in excess of its interest costs have been omitted in our model, some charges in excess of net capital costs previously computed would be required, theoretically, as a premium for risk assumed. Of course, there is no satisfactory device by which to impute risk premium on securities issued for government investments. But any judgment as to the risk involved certainly should take into account experience with similar federal government investments and the operating and estimating record of the particular federal agency involved.

Conclusions

Certain common elements of recent AEC experience in contracting from private and public power suppliers have been illustrated by the foregoing hypothetical models. The details, of course, may be questioned from varying points of view. Allowing for considerable dispute over the details, the analysis, nevertheless, supports several generalizations regarding differences in capital costs to government for supplying AEC power from privately- or publicly-owned facilities:

1. Adjusting for federal taxes to determine the net cost to government for AEC's power does not lessen the costs proportionately more under private ownership than under government powership. This is due to (1) the low ratio of equity-debt capital in private utility combines serving AEC, which minimizes the amount of corporate profits taxes, and (2) the low tax rate on interest income of insurance companies, the exclusive bond holders for the private utility combines. Federal taxes, on the other hand, recapture a larger part of the interest on Treasury securities, which are held in larger part by corporations and private individuals.
2. After eliminating federal taxes, a substantial part of the difference in net capital costs to government consists of state and local tax liabilities of private utility combines. The suggestion, however, that state and local taxes should be subtracted in comparing costs to government of alternative power sources for AEC raises fundamental questions about inter-government tax immunity and the propriety of increasing national defense cost to taxpayers generally, largely for the benefit of property taxpayers in a particular locality.
3. The major part of the difference in net capital cost to government during the 25-year contract period is due to both (1) the higher returns on investment in the private utility combine as a reward for risk-bearing, and (2) a shorter capital recovery or write-off period, which reduces risk.
4. Should AEC extend the contract to the full 35-year useful life of the plant, a smaller difference in accumulated net cost to government would be realized, but some account of the time distribution of costs and benefits to government is necessary to compare the true economic costs involved.
5. Should AEC fail to extend the contract beyond 25 years, the equity owners of the private utility combine risk no capital loss but stand to gain a potential windfall gain over the remaining income-earning life of their fully amortized plant. In a federally-owned plant the government risks failing to recover the rest of its capital from alternative public and/or private customers, but if revenues from other customers exceed costs, the possibility of a small gain is an offset against the risk of loss.

The Geography of Manure

By EUGENE MATHER* *and* JOHN FRASER HART**

THE agricultural importance of animal manure was recognized in Europe long before the birth of Christ, and that importance has increased with the passage of time and the development of agriculture. The medieval Flemish proverb: "Point de fourrage, point des betail, point des betail, point de fumier, point de fumier, point de fourrage,"[1] has been replaced in modern times by such adages as the English: "Where there's muck, there's luck,"[2] or the remark of the Danish farmer that "manure puts the cake on the farmer's table."[3] The European attitude is best summarized by the statement that "farmyard manure . . . . has formed the basis of arable farming throughout the ages. In spite of the great development of fertilisers during the last ninety years, farmyard manure is still the standby of arable farmers; it has been supplemented—not supplanted—by chemical fertilisers."[4] Conversely, in newer societies manure is not given the esteem accorded it in older and more stable agricultural communities.[5] The hazards of continuous cropping with little manure are now beginning to be recognized in newly settled lands, however, and Americans can no longer continue to ignore the importance of manure in the agricultural economy. It is our purpose to discuss the history of manure in agriculture, the characteristics of manure which endow it with such striking agricultural importance, and regional variations in the manner in which manure is used today.

The Agricultural History of Manure

There is little evidence to confirm or deny the use of manure by pre-historic farmers. Clark remarks that "though dung carts may be able to tell more of economic life than chariots or hearses, it is only too evident which would be preferred to accompany chieftains to their graves."[6] He believes that systematic use of manure for agricultural purposes originated when shifting cultivation was replaced by fixed fields during the Bronze Age.[7] It appears that a Late Bronze Age farmer at Jarlshof, in the Shetlands, may have collected manure in his stables,[8] and that the builder of manure carts was a regular member of the village by the end of the prehistoric period.[9] It seems safe to assume that plows used on fixed fields of the early Iron Age required draft animals which

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[1] Quoted in A. Daniel Hall, *Fertilizers and Manures* (London: Murray, 1909 [4th ed. rev. by A. M. Smith, 1947]), p. 3.

[2] W. S. Mansfield, "The Maintenance of Fertility in Arable Land," *Agriculture, The Journal of the Ministry of Agriculture*, Vol. 43, 1942, pp. 191-194; reference on p. 193.

[3] *The Times* (London), September 21, 1953.

[4] H. V. Garner, *Manures and Fertilizers*, Great Britain: Ministry of Agriculture and Fisheries Bulletin No. 36 (10th ed.), London, 1952, p. 1.

[5] A survey of six recent volumes of a leading geographical journal reveals that 61 of 168 articles dealt at some length with agricultural practices. Only 8 of the 44 agricultural articles (18 percent) written by American or Canadian geographers recognized the importance of manure; in contrast, 9 of 17 agricultural articles (53 percent) written by Europeans mentioned manure, if only to say that it was wasted in the area studied. American lack of appreciation for manure appears to be compounded of several factors: (1) the "Chic Sale" tradition in American humor, which makes excrement a naughty topic; (2) the long range hazards of cropping without manure are only beginning to be recognized; (3) the American preference for the artificial. Cement, for instance, may be made to look like limestone, flour is "enriched" with the very vitamins milled from wheat, metal cabinets are made to resemble wood, and "soil conditioners" are used to maintain soil structure while manure is discarded. One of the developers of krilium, for instance, states that he would never recommend its use if manure is available.

[6] J. G. D. Clark, *Prehistoric Europe, The Economic Base* (London: Methuen, 1952), p. 303. In a personal letter, Professor Gottfried Pfeifer of Heidelberg notes a similar tendency in modern times to overlook the commonplace, and remarks that in Europe one usually takes *misthaufen* (manure heaps) too much for granted.

[7] *Ibid.*, p. 98.

[8] Christopher and Jacquetta Hawkes, *Prehistoric Britain* (Harmondsworth: Penguin Books, 1943), p. 117.

[9] Clark, *op. cit.*, [see footnote 6, above], p. 309.

were protected in stables and that manure from these stables was used to maintain the fertility of the fields.

Classical literature contains many specific references to the importance and use of manure. Odysseus, for instance, upon his return to Ithaca found his old hound lying on the pile of mule and cattle manure which was to be used to fertilize the fields.[10] One of the Spartan soldiers in *Lysistrata* (411 B.C.) proclaims his desire to stop fighting so that he can go back to his farm and cart manure to the fields.[11] Biblical recognition of the use of manure is evidenced in Christ's parable of the fig tree.[12] In Italy the use of manure had become so well established by the beginning of the Christian era that the Latin authorities on agriculture all stress its importance. Cato recommended folding of sheep on arable land,[13] cautioned the farmer to maintain a large dung heap and suggested that half the manure be used on forage crops, a quarter on the olive orchard, and a quarter on the meadows.[14] Varro, writing about 35 B.C., echoes Cato, and in addition suggests that the servants' privy be placed over the manure pit.[15] In the early days of the Christian era Columella sounds surprisingly modern as he compares the quality of manure produced by various animals and gives instructions for its storage and use.[16]

[10] *The Odyssey*, XVII, lines 296-299.

[11] Aristophanes, *Lysistrata*, line 1174.

[12] Luke, Chapter XIII, verses 6-9.

[13] Folding refers to intensive grazing of small enclosed segments of a field in succession until the entire field has been grazed and manured. The movable fences used in folding are called hurdles, so in parts of the world the practice is known colloquially as "hurdling." Eugene Cotton Mather and John Fraser Hart, "Fences and Farms," *Geographical Review*, Vol. 44, April 1954, pp. 201-223; reference on p. 210.

[14] Cato, *De Agri Cultura*, V, 8; XXIX; XXX; L, 1. Cato specifies that meadows must be manured during the dark of the moon in early spring, a precaution not considered essential by modern agronomists.

[15] Varro, *Rerum Rusticarum*, I, xiii, 4; I, xxxviii, 2. Twenty centuries later privies are still placed over the farm manure pile in some parts of Europe.

[16] Columella, *Rei Rusticae*, I, vi, 21-22; II, v, 1-2; II, xiv, 1-6.

Medieval agriculture did not reach the high standard set by the Romans, but manure remained important in an age when artificial chemical fertilizers were unknown. Chaucer's plowman, for instance, had hauled many loads of dung.[17] Under the medieval three-field system, however, the commonest method of adding manure to the soil was folding animals on the fallow. Many of the peasants of East Anglia were subject to "fold-soke" (an obligation to graze sheep on the lord's land; the lord realized that the loss of forage was more than compensated by increased fertility) and the custom seems to have been an old one at the time of the *Little Domesday Book* in 1086.[18] Even where free peasants could not be required to render this service, the necessity of manure required that each local area maintain a balance between agriculture and grazing so that fertility would not be lost.[19] Leases often specified the amount of manure to be applied to the farm and categorically forbade, under pain of fine, that any manure be sold off the farm.[20]

The Agricultural Revolution, which brought an end to medieval agriculture, was intimately related to increased production of manure. In Britain, for instance, Smith shows that the new husbandry of the eighteenth century was based on constant tillage, the integration of new crops into the rotation, and the

[17] Geoffrey Chaucer, *Canterbury Tales*, Prologue, lines 529-530.

[18] Sir John Clapham, *A Concise Economic History of Britain, From The Earliest Times to 1750* (Cambridge: Cambridge University Press, 1949), p. 105.

[19] H. C. Darby, "The Economic Geography of England, A. D. 1000-1250," pp. 165-229 of H. C. Darby, ed., *A Historical Geography of England Before A. D. 1800* (Cambridge: Cambridge University Press, 1948), reference on pp. 197-198.

[20] J. H. Clapham and Eileen Power, eds., *The Cambridge Economic History of Europe from the Decline of the Roman Empire;* Vol. I, *The Agrarian Life of the Middle Ages* (Cambridge: Cambridge University Press, 1942), references to conditions in France, Italy, Spain, and Germany respectively on pp. 135, 332, 358, and 541.

close association of crops and stock.[21] Cattle fattening on crops, crop waste, and oil cake produced vast quantities of manure which was carted back to the fields; sheep were folded, particularly on light soils, where their treading served to consolidate the soil. The integration of crop production and livestock husbandry during the Agricultural Revolution led to the development of various systems of mixed farming which have been transplanted to much of the rest of the world from northwestern Europe. Mixed farming (with the rotation of crops) is particularly conservative of soil fertility, because a large share of the plant nutrients taken from the soil by crops is returned as manure.

The development and widespread dissemination of artificial chemical fertilizers after the fourth decade of the last century has tended to obscure the importance of manure. Ideally, manure should be returned to the soil to maintain its inherent fertility, whereas chemical fertilizers should be used to increase and intensify production and to remedy any deficiencies. In many parts of the world, however, and particularly in the Americas, artificial fertilizers have tended to replace manure completely, instead of serving as a supplement, and the manure has been discarded and wasted. Complete reliance on artificial fertilizers has led to abandonment of livestock in many areas, and frequently has permitted development of mono culture and the undesirable practices associated with mono culture. Plant foods are placed in the soil each spring with the seeds, and removed in the form of crops each harvest. The soil structure suffers from lack of organic matter, and the store of plant foods sinks so low that artificial fertilizer becomes essential to crop production. If this situation is not remedied by growing hay or pasture crops for a number of years, or by providing organic matter through use of manure or green manure crops, resort will have to be made to soil conditioners to save the soil from complete deterioration and erosion.[22]

[21] Wilfred Smith, *An Economic Geography of Great Britain* (London: Methuen, 1949), 23-30.

The Nature of Manure

In terms of manure production, a farm animal may best be described as "a huge tube with thick walls and open ends, one end being the mouth and the other the anus, while the walls form the animal's body."[23] The digestible portions of the animal's food are absorbed through the walls, whereas the indigestible portions pass out in the feces. For the most part, the materials of the solid excrement, which have resisted digestion, are equally resistant to ordinary decay processes in the soil; these materials become available to plants only slowly over a period of several months or even years.[24] The most valuable part of the manure is urine, containing the soluble fraction of the animal's food. Urine, excreted after passing through the blood stream, contains little phosphorus, most of the potash, and over half the nitrogen voided by the animal.[25] Urine is collected directly, or by absorption in various types of litter, such as straw, cornstalks, sawdust, or peat. The terms

[22] We do not advocate the abandonment of artificial fertilizers; in fact, we champion their proper use as a means of intensifying and increasing crop production, but they should be used as *supplements* to manure and not substituted as the sole source of plant food.

[23] E. J. Russell and E. H. Richards, "On Making and Storing Farmyard Manure," *Journal of the Royal Agricultural Society of England*, Vol. 77, 1916, pp. 1-36; reference on p. 5.

[24] Selman A. Waksman and K. R. N. Iyer, "Contribution to our Knowledge of the Chemical Nature and Origin of Humus: IV, Fixation of Proteins by Lignins and Formation of Complexes Resistant to Microbial Decomposition," *Soil Science*, Vol. 36, 1933, pp. 69-82; reference on pp. 70, 81-82.

[25] A. D. Longhouse, J. T. Reid, O. J. Burger, and I. D. Porterfield, "Liquid Manure is Valuable," West Virginia Agricultural Experiment Station Bulletin 357, Morgantown, 1952, p. 3.

"stable manure" and "barnyard manure" thus commonly refer to a mixture of feces and urine-soaked litter.

The composition of fresh manure is directly related to the nature of the animal, but it is only possible to compare the manure of the various types of animals within fairly broad limits (Table I). A beast which is growing, fattening, or producing milk retains certain portions of the manurial constituents of its food, whereas virtually all of the feed of other mature animals is recoverable as manure. As a general rule, the richest and most concentrated form of manure is dropped by chickens, which void urine with their feces. Cattle and hogs commonly produce more manure than do horses and sheep; the former drink more water, so their feces are more moist and their

TABLE I—Amount and Composition of Manure Produced by Mature Animals*

Type of animal	Average daily production in pounds per 100 liveweight pounds	Percentage of Plant Foods in					
		Solid Manure			Liquid Manure		
		Nitrogen	Phosphorus	Potassium	Nitrogen	Phosphorus	Potassium
Hogs.....	9.8	0.6	0.5	0.5	0.4	0.1	1.0
Cows.....	8.5	0.3	0.2	0.2	1.0	.....	1.0
Horses.....	4.8	0.5	0.3	0.2	1.2	.....	1.5
Sheep.....	4.1	0.7	0.5	0.2	1.7	.....	2.1
Poultry....	2.3	1.0	0.8	0.4	.....	.....	.....
Humans....	1.8	.....	.....	.....	.....	.....	.....

*Sources: Robert M. Salter and C. J. Schollenberger, *Farm Manure*, Ohio Agricultural Experiment Station Bulletin 605, 1939, p. 7: John Lossing Buck, *Land Utilization in China* (Shanghai: 1937), p. 258.

urine is less concentrated. The dryness of horse and sheep manure is conducive to rapid bacterial change, so these "hot manures" decompose rapidly and must be used with care on certain crops.[26]

The quality of manure is also related to the animal's feed (Table II). Although the character of individual livestock feeds varies greatly, as a general rule the richer feeds are more readily digestible and thus produce richer manure. Seven-eighths of the nitrogen of decorticated cotton cake, for instance, is digestible, and thus recoverable in manure; on the other hand, little more than half of the nitrogen in hay is digestible.[27] British farmers frequently give their animals heavy rations of oil cake with the sole purpose of producing adequate supplies of manure.[28]

Fresh manure decomposes rapidly. Micro-organisms in the manure attack the urea of the urine and produce ammonium carbonate, which in turn rapidly breaks down into ammonia and carbon dioxide. Both of these gases escape to the atmosphere; it is ammonia

[26] H. V. Garner, *op. cit.* [see footnote 4, above], p. 11.

[27] Hall, *op. cit.* [see footnote 1, above], p. 151. The relation between feeding stuffs and manure has been carefully studied in Britain because an out-going tenant must be compensated for the residual manurial values of his feeding stuffs. As a general rule, he is reimbursed for 30 per cent of the nitrogen, 50 percent of the phosphate, and 60 percent of the potash contained in the animals' feed. James A. S. Watson and James A. More, *Agriculture, The Science and Practice of British Farming* (Edinburgh: Oliver and Boyd, 1924; 9th ed., 1949), pp. 108-109.

[28] A. K. M. Meiklejohn, "Agriculture," pp. 95-112 of A. G. Oglivie, ed., *Scientific Survey of South-Eastern Scotland* (Edinburgh: British Association for the Advancement of Science, 1951); reference on p. 100. See also H. G. Sanders, *Rotations*, Great Britain, Ministry of Agriculture and Fisheries Bulletin No. 85, London, 1944, p. 8.

TABLE II—AVERAGE PERCENTAGE OF PLANT FOODS IN VARIOUS FEEDING STUFFS*

Feeding Stuff	Percentage by weight of		
	Nitrogen	Phosphorus	Potassium
Cotton cake	6.90	3.10	2.00
Soybean cake	6.85	1.30	2.20
Palmnut cake	2.50	1.20	0.50
Coconut cake	3.40	1.40	2.00
Peanut cake	7.62	2.00	1.50
Meat meal	10.50	4.00	0.70
Fish meal	9.00	8.50	1.40
Beans	4.00	1.10	1.30
Peas	3.60	0.85	0.96
Wheat	1.80	0.85	0.53
Barley	1.65	0.75	0.55
Oats	2.00	0.60	0.50
Corn	1.70	0.60	0.37
Rice meal	1.90	0.60	0.37
Clover hay	2.40	0.57	1.50
Meadow hay	1.50	0.40	1.60
Mangolds	0.22	0.07	0.40
Swedes	0.25	0.06	0.22
Turnips	0.18	0.05	0.30
Sugar beet pulp (dry)	1.30	0.25	0.40
Potatoes	0.34	0.16	0.60
Wheat straw	0.45	0.24	0.80
Barley straw	0.40	0.18	1.00
Oat straw	0.50	0.24	1.00

*Source: Great Britain, Department of Agriculture for Scotland, Advisory Leaflet No. 24 (New Series), *Residual Values of Fertilizers and Feeding Stuffs*, Fourth Report (1952) of the Scottish Standing Committee (Edinburgh: 1952), p. 6.

gas which gives stables their distinctive odor. As a result of this and other more complex decompositional changes, it is estimated that a loss of about fifteen percent of the nitrogen may be expected even under optimum conditions of storage; if the manure is not properly stored, more than a third of the nitrogen may be lost.[29] Various methods have been developed to minimize the loss of nitrogen. Peat litter, for instance, not only absorbs up to ten times in weight in urine but also absorbs ammonia gas which has escaped to the air of the stable.[30] Chemical preservatives, such as gypsum, sulfuric acid, and superphosphate, have been used to stabilize the urea and thus to prevent the formation of ammonium carbonate.[31] All of these preservatives have the added advantage of keeping down the smell, because [the manure which smells strongest is losing nitrogen most rapidly. Neither potash nor phosphate on the other hand, is volatile; under normal barnyard or stable conditions they will not be dissipated by vaporization.

Agricultural Use of Manure

Manure, which is most commonly used to fertilize arable land, may be collected in stables, barnyards, or feed lots. In parts of Europe the liquid manure is collected in separate tanks, but it is more usual, both there and in other parts of the world, to absorb it in some form of litter. The mixture of solid manure and urine-soaked litter may be removed daily to nearby piles, although it is most efficient to allow manure to accumulate under the feet of animals bedded on sufficient litter to absorb the urine.[32] If manure is removed daily, the manure pile should be protected by shed covers and kept compacted to avoid rapid loss of nitrogen by decomposition and leaching. A feed lot should be provided with a floor of some impervious material, such as concrete, if manure is to be collected efficiently. The manure is commonly hauled directly to the field from the feed lot. Although this avoids

[29] E. J. Russell and E. H. Richards, "The Changes Taking Place During the Storage of Farmyard Manure," *Journal of Agricultural Science*, Vol. 8, 1916-17, pp. 495-563; reference on pp. 555-560.

[30] Hall cites data indicating that air in a stable littered with peat contains less ammonia on the seventeenth day than the air of a straw littered stable on the second. Hall, *op. cit.* [see footnote 1, above], p. 154.

[31] Robert M. Salter and C. J. Schollenberger, *Farm Manure*, Ohio Agricultural Experiment Station Bulletin 605, Columbus, 1939, pp. 22-24.

[32] Salter and Schollenberger show that accumulation in a covered feed lot or deep stall may permit recovery of 87 percent of the nitrogen in the feed, whereas with daily removal the loss may run as high as 37 percent. *Ibid.*, p. 30.

double handling, the manure spread in early winter is subject to severe leaching and some decomposition before it can be incorporated in the soil by plowing.

A number of devices facilitate the handling and spreading of manure. Manure may be removed from the barn floor by fork, shovel, broom, or water hose, although the latter method is used only when the value of manure is not appreciated. Many dairy barns are equipped with overhead monorail-and-car to transport manure from the barn to the manure heap. Mechanical loaders attached to the front of tractors scrape manure from the feed lot floor and load it directly into manure spreaders.[33] These spreaders, which distribute manure by means of an endless chain conveyor, can also be used to spread lime and chemical fertilizers. Liquid manure spreaders are relatively uncommon in the United States, but the "honey wagon" is frequently seen in Europe. Hand spreading of manure from wagons, which is a common practice in the less mechanized parts of the world, including the American Southeast, permits more accurate placement of manure in crop rows or hills.

Wherever practical, it is easier to allow the animals to spread their own manure by grazing them in the fields to be fertilized. This may range from intensive folding systems through rotational grazing of improved pastures to ranching systems which are so extensive that manurial effects are not apparent. Folding involves the use of movable fences, or "hurdles," which can be moved successively to each part of the field, and thus ensure intensive grazing and manuring of the entire field. Folding minimizes the danger of parasitic infestation, but necessitates additional expenditure on fencing and labor, so is largely restricted to areas of intensive farming where labor is relatively inexpensive. The American counterpart of the hurdle is the temporary electric fence, which is of increasing importance in those parts of Europe where labor is scarce.

Croplands in mixed farming systems are frequently alternated with improved pastures and thereby receive the benefit of animal manure at least once in the rotation cycle. Rotational grazing involves alternate use of permanently fenced pasture units independently of crops. The pasture units may vary in size from relatively small enclosures to extensive ranges where ranching is dominant. "Halo spots" are a common sight in these pastures and constitute a special management problem. Both cattle and horses relish the rich grass fertilized by their own urine, but assiduously avoid the halos around their own manure.[34] On the other hand, each type of animal relishes the "halo spots" of other animals, so it was the standard practice in Germany to graze one horse with each ten cattle.[35] A number of efforts have been made to eliminate "halo spots" where mixed grazing is impractical, because they may preclude the use of a significant proportion of a permanent pasture. Drag-harrowing breaks up the piles and incorporates the manure into the soil; after a brief period during which animals refuse to graze, the entire pasture is once again usable. Plice has suggested that the phosphonitrogen imbalance in solid manure tends to inhibit sugar formation in plants growing on "halo spots," and has demonstrated that drag-harrowing might be

[33] *Cf.*, James E. Rowan, "Mechanization of the Sugar Beet Industry of Scottsbluff County, Nebraska," *Economic Geography*, Vol. 24, 1948, pp. 174-180; reference on p. 177.

[34] Alfred G. Etter, "Watching Animals Eat," *The Land and Land News*, Vol. XI, 1953, pp. 280-288; reference on p. 283.

[35] *Ibid.*, p. 283, Farmers in parts of the American Southeast assume that mules are pastured free on cattle farms because they consume the "halo spots" which cattle refuse to eat.

eliminated by treating "halo spots" with molasses or some other sweetening agent.[36]

Non-Agricultural Aspects of Manure

Manure has many non-agricultural manifestations, despite its primary significance as a fertilizer. It is an important fuel in many dry and treeless regions.[37] In writing of an Iranian village, Kernan remarked:

"I had seen the most tragic and fatal sign of fuel starvation—fatal to the soil on which village life depends. Manure bricks were drying upon the walls. Their smudgy fires and odoriferous smoke glowed in the little courts that front each house. Iranian farming rarely makes provision for building up humus in the soil. Cover crops and manure are not used for this purpose."[38]

The collection of "cow chips" and "buffalo chips" to heat sod houses was an after-school chore on the Great Plains as late as the turn of the century.

Bird droppings are of importance on the landscape, particularly with regard to the establishment of plant communities. The blue jay has been responsible for many cedar trees along fence rows in eastern United States. Birds are believed responsible for isolated birch-aspen communities in the moorlands of Britain, and the "bird-rocks" of the Canadian Arctic are well known among botanists. Guano, of course, is too well known by geographers to require more than passing reference; no one has ever estimated the expenditure required for removal of guano frcm buildings, monuments, and even clothing in our large urban centers. Coprolites have provided paleontologists with valuable clues to the life of the past. In a lighter vein, one manifestation of manure is described in the *Saturday Evening Post:*

"While I was visiting the assay headquarters, director Bill Mattson picked up a gob of heavy stuff about the size of a pie. It was glossy black and looked like asphalt. It had come air mail, special delivery, from an impatient Kansas City businessman who had been hunting in Colorado. 'We get three or four of these a year,' Mattson explained. 'It just happens that pack rats have an always-in-the-same-place sanitary system, and after several years this is the result. The stuff may be a hundred years old, but I'll tell you, it's a ticklish job to write this man a letter and tell him what his sample is.' "[39]

The Manure Map of the World

Distributional aspects of the use of manure are depicted on the world map (Fig. 1). Literature for some regions upon which to base such a map is strikingly abundant, whereas for other areas information is quite limited. In view of this, the map is presented as a preliminary effort. Extensive correspondence with agricultural experts in various parts of the world has clarified the mapping of numerous doubtful areas but it is hoped that further research will produce refinements. It has proven impractical to map manurial practices in areas where only small amounts of manure are produced so we have restricted our attention to those areas where manure is produced in significant quantities. It would appear appropriate, as a guide to future research, to summarize our findings concerning the use of manure in the various parts of the world.

Europe and the Mediterranean Basin. Production of farm manure has been a primary concern of European farmers.[40]

[36] M. J. Plice, *Agronomy Journal*, Vol. 43, 1951, pp. 341-343; reference on p. 342.

[37] For instance, see the photograph in George B. Cressey, *Asia's Lands and Peoples, A Geography of One-Third of the Earth and Two-thirds its People* (New York: McGraw-Hill, 1944; 2nd ed., 1951), p. 447. Shen remarks that yak dung is used for fuel in treeless Tibet. T. H. Shen, *Agricultural Resources of China* (Ithaca: Cornell University Press, 1951), p. 291.

[38] Henry S. Kernan, "Planting Fuel in Iran," *The Land and Land News*. Vol. XI, 1953, pp. 313-316, reference on p. 314.

[39] Lewis Nordyke, "They're Finding Fortunes in the Hills," *Saturday Evening Post*, 23 August 1953, pp. 17-19, 79 *et seq.;* reference on p. 79.

[40] Pierre Gourou, "The Development of Upland Areas in China," in *The Development of Upland Areas in the Far East* (New York: Institute of Pacific Relations, 1949), p. 10.

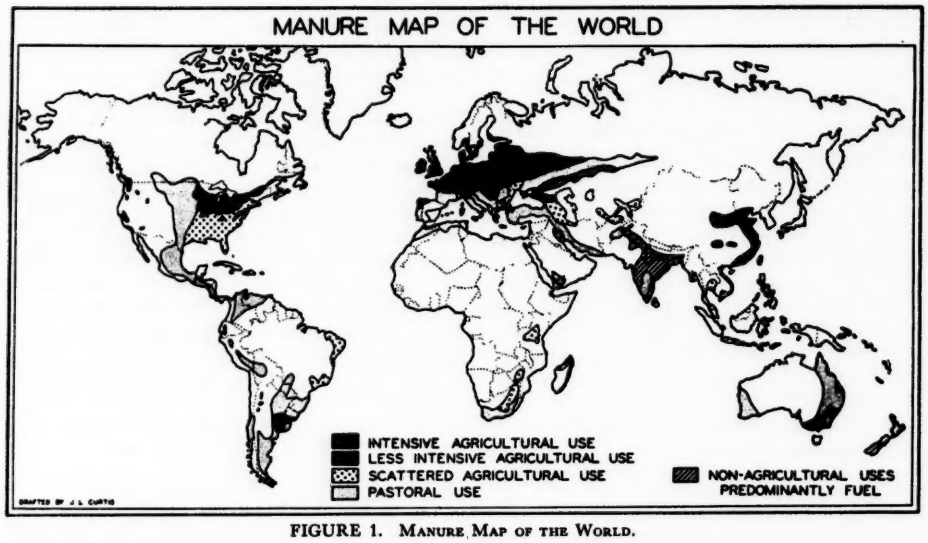

FIGURE 1. MANURE MAP OF THE WORLD.

The loss of livestock in both World Wars has had serious consequences for European agriculture because barnyard manure has been of basic importance as a fertilizer.[41] Manure has been especially prized by gardeners. Thomasson quotes a British lady on the proper techniques of gathering sheep dung in public parks without attracting the attention of romantic young couples, and mentions her misgivings as to whether or not it came under the head of "mineral rights" and as such belonged to the Crown.[42]

In normal times British livestock received "immense quantities of imported feeding stuffs. Every pound of this which they received added to Britain's soil some of the plant food from the land where the cotton or linseed was grown."[43] On the East Lothian plain of Scotland, which is famous for its rich arable farms, bullocks commonly "received a daily ration of 4 lb. linseed cake and 4 lb. undecorticated cotton cake—wasteful feeding, but good dung resulted! . . . . Some farmers reckon that winter court [yard] feeding of cattle does not pay, but the majority are satisfied that the returns from cash cropping justify any deficit from their keep."[44] Lowland arable farmers in eastern England are also willing to take a slight loss on livestock in order to ensure the large supply of manure so necessary to successful arable cropping.[45] Farmers in the East Midland counties rent "yards" to cattle feeders; as compensation for fodder and care of the animals they receive cash and dung.[46] Manure is especially prized in many British market gardening areas; near Edinburgh, for instance, "heavy

[41] For the years after 1918, see Karl Brandt, *The Reconstruction of World Agriculture* (New York: W. W. Norton, 1945), p. 42. For the period after the Second World War, see *European Programs of Agricultural Reconstruction and Development* (Washington: Food and Agriculture Organization of the United Nations, 1948), p. 1.

[42] R. R. Thomasson, "Barnyard Manure in Polite Society," *Horticulture*, Vol. 30, 1952, p. 141.

[43] Mansfield, *op. cit.*, [see footnote 2, above], p. 193. British fertilizer manufacturers carefully evaluate the availability of feeding stuffs in computing fertilizer needs and planning production. *The Times* (London), December 24 1953.

[44] Meiklejohn, *op. cit.*, [see footnote 28, above], p. 193.

[45] W. Ellison, *Marginal Land in Britain* (London: Geoffrey Bles, 1953), pp. 130-131.

[46] Allan Knox, "The East Midland Counties," pp. 93-111 of J. P. Maxton, ed., *Regional Types of British Agriculture* (London: George Allen and Unwin, 1936); reference on p. 108.

dressings of purchased organic matter have enriched these soils until they might well be classified as man-made; some go so far as to consider them good samples of manure!"[47]

Scandinavian farmers are also keenly aware of the value of manure. Dairy farms, for instance, depend on manure from cows, pigs, poultry, and horses as the basis of good crops.[48] In southern Scandinavia manure is carefully collected, stored, and spread, so that little of it will be wasted.[49] Lack of adequate fences in Finland prevents complete utilization of croplands for forage, but stable manure is carried to the fields by sled during the winter months and spread by hand during the spring. Perhaps this is why the Lapps call Finns "Lantalainen," which can be translated as "manure spreaders."[50]

Many farmers on loamy soils in the Low Countries, where the Agricultural Revolution began, practiced a rotation of grain, sugar beets, and pasture, and depended upon livestock to maintain soil fertility. Some of these farms switched to sugar beet monoculture, with sole reliance on chemical fertilizers, only to discover that crop yields declined markedly through lack of organic matter in the soil.[51] In consequence, their present trend is toward integrated agriculture once again.

His manure pile is of prime importance to the French farmer.

"Le paysan s'intéresse toujours à son fumier, car il sait voir en lui la condition de la fertilité de son sol. Il faut être aussi niais que certains citadins pour s'en gausser et faire la moue. Dans beaucoup de campagnes la dot d'une fille est estimée à l'importance du tas de fumier que produit la ferme de son père."[52]

The banker also estimates the French farmer's net worth by the size of his manure pile.

Horses, cattle, and hogs are relatively scarce around the Mediterranean basin, and the rough hill lands grazed by sheep and goats are unsuitable for crops. Manure is of agricultural significance only in those favored localities where animal husbandry is closely associated with crop production. In the Po valley, for instance, both liquid and solid manures are prized, as the Italian film, "Times Gone By," illustrates in a sequence depicting two peasants in a roaring fight over some horse manure. Even in parts of the Mediterranean basin where livestock are of little importance farmers still follow the ancient custom of keeping pigeons to produce manure for their crops.[53]

The use of manure is complicated by a number of environmental factors in the mountain belt which stretches across southern Europe. Grain production, and hence the supply of straw for litter, is rendered difficult by climatic conditions. Scarcity of trees in the alpine zone has led to the use of manure for fuel. The grazed mountain lands are too rugged for crop production, but stall feeding in the valleys produces supplies of manure which are used as fertilizing material.

Manure is of vital agricultural importance in the scarplands of Germany and on the Alpine Foreland of Switzerland, Germany, and Austria. Fences are virtually absent; cattle are stall-fed, and agricultural villages are characterized by the strong odor emanating from the manure pile of each farmer in the

[47] Meiklejohn, *op. cit.*, [see footnote 28, above], p. 98.
[48] *The Times* (London), September 21, 1953.
[49] Personal communication from Aage H. Kampp.
[50] W.R. Mead, *Farming in Finland* (London: Athlone, 1953), pp. 156-157.
[51] Personal communication from Professor Rene J. F. Tavernier.
[52] Henri Prat, *L'Homme et le Sol* (Paris: Gallimard, 1949), p. 120.
[53] Ralph S. Yohe, *What our Farmers Can Learn From Other Lands* (Ames: Iowa State College Press, 1953), p. 5.

village. Manure is carefully conserved, carted to the fields, and spread by hand. Night soil is also highly prized in Germany, as in other parts of Europe, but this fact is scarcely mentioned in geographic literature.[54] Nevertheless, the use of night soil poses a problem of public health which must be reckoned with by American tourists and military forces, as well as by the local populace.[55]

The peasant farmers of eastern Europe (including west central Russia) have seldom been able to afford chemical fertilizers so have depended almost entirely on manure.[56] Manure has been absolutely essential to crop production in the non-black-soil belt of European Russia, where peat instead of straw is commonly used for litter.[57] The decline in livestock numbers associated with collectivization and war has had such serious effects on crop production that the Soviets have diverted part of their limited supply of chemical fertilizers to this area.[58] Chemical fertilizers are also used extensively in the Uzbekistan cotton producing areas, where grain production has been sacrificed to provide more cotton land.[59] Although alfalfa is a crop of some considerable importance, and livestock are numerous, there is little litter with which to conserve liquid manure. Prianishnikov notes that it is hardly logical to transport straw for litter 1,500 to 2,000 kilometers from the Siberian grain-producing areas which export grain to Uzbekistan.

Asia and Australia. Livestock are relatively scarce in the Middle East and not all of their manure is used for agricultural purposes although intensive manurial practices characterize some agricultural areas. In Israel, for instance, the supply of manure falls far below the demand, although manure is collected from chickens, dairy cattle, mules, donkeys, horses, sheep, and goats, and the Israeli government is encouraging increased production and use of manure (Fig. 2).[60]

FIGURE 2—THE MANURE CYCLE, AS ILLUSTRATED ON COVER OF AN ISRAELI AGRICULTURAL BULLETIN.

[54] One might mention, however, Professor Stamp's criticism of "the utter folly of our present waste by town sewage systems which send valuable nitrogenous manures out to sea." L. Dudley Stamp, "The Under-Developed Lands of Britain," the Albert Howard Memorial Lecture for 1954 under the auspices of the Soil Association, p. 10.

[55] No one who has ever seen them can ever forget the vivid "before-and-after" signs with which German druggists advertise patent remedies for worms and other intestinal parasites.

[56] *Report of the F. A. O. Mission for Poland* (Washington: Food and Agriculture Organization of the United Nations, 1948), pp. 5, 67.

[57] A. A. Grigoryev, "The Reclamation of the Forest Belt of the U. S. S. R. in Europe," *Geographical Journal*, Vol. 119, 1953, pp. 411-419; reference on pp. 416-417.

[58] Lazar Volin, *A Survey of Soviet Russian Agriculture*, United States Department of Agriculture, Agricultural Monograph No. 5 (Washington: Government Printing Office, 1951), p. 94.

[59] D. N. Prianishnikov, "Some Wartime Agricultural Problems in the Soviet Union," *Foreign Agriculture*, Vol. 9, 1945, pp. 146-150; reference on pp. 146-147. Volin notes that consumption of chemical fertilizers in this cotton-producing region surpasses that of the much more highly industrialized Germany. Volin, *op. cit.* [see footnote 58, above], p. 95.

[60] Personal communication from Professor David H. K. Amiran.

In Iraq, however, despite the use of manure on cotton fields, gardens, orchards, and pastures, much of the manure produced is used for fuel, as is true throughout the Middle East.[61] Keen actually maintains that it is more economical to use manure for fuel than for fertilizer in areas with dry climates, because of the rapid loss of nitrogen by oxidization. He feels that the heat of oxidation should be obtained in the fireplace, and that the phosphate and potash of the manure will still be reclaimed if the ashes from manure fires are used as fertilizers.[62] In Pakistan, however, where fuel and fertilizer uses are considered competitive, agricultural authorities advocate that as much manure as possible be used as fertilizer.[63]

Livestock play a secondary role in the rice economy of monsoon Asia, and in many areas the rice crop is grown solely with those nutrients derived by natural soil-forming processes.[64] The manure of draft animals is commonly reserved for the rice seed-bed.[65] Nevertheless, it is difficult, with existing farm practices, to collect and use the manure of these animals.[66] The lack of plant foods necessitates unusual practices. Siamese farmers, for instance, dip their seedlings in a paste of bat guano before planting.[67] Silt from ponds, canals, and streams is often used as fertilizer in Southeast Asia. Javanese farmers have discovered that the presence of fish in flooded rice paddies acts as a fertilizer, and increases rice yields as much as 10 to 20 percent.[68]

The use of night soil in China, Japan, and Korea has been so emphasized that the importance of animal manure has been over-shadowed. Shen, for instance, estimates that night soil represents only one-fifth of the manure produced in China.[69] and Trewartha's data indicate that night soil comprises only one-third of the manure used in Japan.[70] Throughout China large numbers of swine are kept as scavengers and manure-producers although the sale of pork no more than covers the cost of their feed.[71] Farm manure provides only one-fourth of the fertilizer required on Japanese farms and much of the so-called manure is actually compost, green manure crops, seaweed, ashes, and other farm refuse; fertilizers are in such short supply that even silkworm excrement is utilized.[72]

Stabling of animals is not necessary in the mild Australian climate, and manure is commonly left in the pastures, although poultry and dairy manure is sometimes collected and sold to city gardeners.[73] Australian farmers consider that wheat production is inadvisable without sheep.[74] Sheep graze wheat stubble, and simultaneously add fertilizer to the land.

Africa. One of the basic agricultural problems of central Africa is the development of a trypanosomiasis-resistant strain

[61] Brad Fisk, "Dujaila: Iraq's Pilot Project for Land Settlement," *Economic Geography*, Vol. 28, 1952, pp. 343-354; reference on pp. 349-350.

[62] B. A. Keen, *The Agricultural Development of the Middle East* (London: Oxford University Press, 1946), p. 48.

[63] Personal communication from Nafis Ahmad.

[64] V. D. Wickizer and M. K. Bennett, *The Rice Economy of Monsoon Asia* (Stanford: Food Research Institute), pp. 253-258.

[65] E. H. G. Dobby, *Southeast Asia* (London: University of London Press, 1950), p. 178.

[66] *Report of the F. A. O. Mission for Siam* (Washington: Food and Agriculture Organization of the United Nations, 1948), p. 33. Wickizer and Bennett estimate that not more than one-eighth of the manure supply of Burma reaches the fields. Wickizer and Bennett, *op. cit.* [see footnote 64, above], p. 256.

[67] Wickizer and Bennett, *op. cit.* [see footnote 64, above], d. 258.

[68] *New York Times*, January 5, 1954.

[69] Shen, *op. cit.* [see footnote 37, above], p. 33.

[70] Glenn T. Trewartha, *Japan, A Physical, Cultural, and Regional Geography* (Madison: University of Wisconsin Press, 1945), p. 197.

[71] Shen, *op. cit.*, [see footnote 37, above], p. 293.

[72] E. A. Ackerman, *Japan's Natural Resources and their Relation to Japan's Economic Future* (Chicago: University of Chicago Press, 1953), pp. 435-440; manure collection and use are illustrated in photographs on pp. 408 and 410.

[73] Personal communication from J. Gentili.

[74] S. M. Wadham and G. L. Wood, *Land Utilization in Australia* (Melbourne: Melbourne University Press, 1939), p. 136.

of livestock.[75] Until such time the supply of manure will necessarily be limited. Many native tribes in the East African Highlands are ignorant of the fertilizing value of manure. The native in Uganda "is not aware that waste products from cattle, when properly made into manure, have any value whatever as fertilizers for land."[76] Crop residues are burned in Kenya, and the use of cattle manure is just beginning under European tutelage.[77] The Kikuyu actually believe that cattle will become possessed of an evil spirit (thahu) and die if their dung is placed in the soil or removed.[78] "Manure is regarded as useless dirt and its presence in gardens is accidental rather than intentional" in Nyasaland.[79] Manure is used locally in much of southern Africa, primarily for specialized crops. In the Rhodesian tobacco belt, for instance, as much as five to ten tons of kraal manure are applied to each acre of tobacco land.[80] Abandoned kraals are used as tobacco fields; rights to this manure-enriched soil have initiated intra-tribal conflicts, and pose a serious land tenure problem.[81]

South America. Most of the livestock of South America graze permanent range land, in such areas as Patagonia, Uruguay, southern Brazil, and the Llanos, and little or no effort is made to save their manure. Mild winter temperatures over most of the continent permit year-round grazing so there is little stable manure even in mixed farming areas.[82] The use of manure in some areas, however, is worthy of note. Many of the livestock of the Pampas graze improved pastures which are rotated with cropland and thus crops receive the benefit of manure. Manure is also used on the vineyards and cane fields of the oases of northwestern Argentina. Many Brazilian orange growers operate dairies with negligible profit in order to obtain manure for their groves.[83] Efforts have been made to rehabilitate exhausted coffee lands in Sao Paulo by use of chicken manure.[84] Manure from the dry lowlands of northeastern Brazil is transported on mule back in leather bags to the cropped fields of the humid "sierras."[85] Cattle on the Altiplano "are raised primarily to provide fertilizer for the fields under cultivation. Only rarely are cattle marketed."[86]

North America. The most intensive manurial practices in North America are found in an area extending from the eastern Great Plains through the Corn Belt into the Dairy Belt of the United States and Canada. In the Dairy Belt manure is either collected in barns or is dropped as the animals graze rotation or permanent pastures. Considerable quantities accumulate in the barns or sheds

[75] Personal communication from Professor Keith M. Buchanan who informs us of experiments indicating that farmyard manure will build up and maintain fertility on even the poorest and most leached rainforest soils in southern Nigeria.

[76] J. D. Tothill, ed., *Agriculture in Uganda* (London: Oxford University Press, 1940), p. 5.

[77] F. B. Wilson, "Composting of Farm and Village Waste in Nyanza Province," *Kenya Department of Agriculture Annual Review, 1950*, p. 59.

[78] G. J. Gollop, "The Use of Manure in Kiambu District," *Kenya Department of Agriculture Annual Review, 1950*, pp. 63-64.

[79] W. B. Morgan, "The Lower Shire Valley of Nyasaland, A Changing System of African Agriculture," *Geographical Journal*, Vol. 119, 1953, pp. 459-469; reference on p. 466.

[80] Peter Scott, "The Tobacco Industry of Southern Rhodesia," *Economic Geography*, Vol. 28, 1952, pp. 189-206; reference on p. 197.

[81] W. Allan, Max Gluckman, D. U. Peters, and C. G. Trapnell, *Land Holdings and Land Usage among the Plateau Tonga of Mazabuka District* (London: Oxford University Press, 1948), pp. 132-135.

[82] Note the analogy to other subtropical areas, such as Australia and the American Southeast, where crops and livestock are also divorced, even on the same holding. Waibel concludes that "the most important thing to do is to end this fatal separation of crop cultivation and stock raising." Leo Waibel, "European Colonization in Southern Brazil," *Geographical Review*, Vol. 40, 1950, pp. 529-547; reference on p. 543.

[83] Personal communication from Wilson Popenoe.

[84] Antonio Carlos Correa, "Cafe e esterco de galinha," *Boletim Superintendencia dos Servicos do Cafe*, Vol. 26, 1950, pp. 859-862; reference on p. 860.

[85] Personal communication from Professor Hilgard O'Reilly Sternberg.

[86] Frank L. Keller, "Finca Inguvi; A Medieval Survival on the Bolivian Altiplano," *Economic Geography*, Vol. 26, 1950, pp. 37-50; reference on p. 46.

during the long winter season when the ground is snow-covered. Manure is distributed to the fields whenever the busy tempo of work on the farm permits, especially during the non-cropping months.

Manure is obtained from a greater variety of animals, and in greater quantities, in the Corn Belt than in any other part of the Western Hemisphere. Cattle, hogs, poultry, and sheep all produce significant amounts of manure here, but the most distinctive manurial aspect of the Corn Belt is associated with the feed lot. Most feed lots exist for the fattening of cattle and hogs. The rich grain and protein supplements fed to the cattle produce rich manure. Grain which passes through the cattle undigested is greedily sought by hogs which consume considerable quantities of feces as they root after the grain. Two to four shoats commonly "follow" each steer.[87] When corn is "cattled down," instead of being fed in the lot, "a sufficient number of hogs should be put into the field to utilize both the corn that the cattle knock to the ground and the undigested corn voided by the cattle in their feces."[88]

Manure is in great demand in market gardening areas along the Eastern Seaboard of the United States.[89] Some farmers in Lancaster County, Pennsylvania, actually make a practice of feeding cattle under contract in return for the manure they produce.[90] With notable exceptions, such as the Bluegrass region of Kentucky, manure is not highly regarded in the American Southeast. In the Southern Appalachian burley tobacco region, for instance, all the manure of the farm is reserved for the tobacco field,[91] but in most other parts of the Southeast manure is merely tossed into heaps to decompose.[92] The inadequacy of fencing in the Southeast prevents rotation of croplands and manured pastures even in those areas where livestock are of increasing importance.[93]

In Cuba, Middle America, and the Great Plains of the United States most manure is dropped on permanent range land. In recent years, however, commercial feedlots which have been established on the Great Plains and in many other parts of the West have proven a valuable source of fertilizer for irrigated cropland. In some irrigated areas farmers have actually begun to keep herds of cattle principally for the manure which they produce.[94] Urban development in the West has been associated with dairying, orchards, and market gardening; manure from the dairy farms has been of considerable value to truck farmers and orchardists.[95]

[87] Roscoe R. Snapp, *Beef Cattle*, (New York: Wiley, 1925; 4th ed., 1952), p. 475. Snapp estimates that hogs following cattle gain from 0.76 to 1.58 pounds per bushel of corn given to cattle, depending on the age of the cattle, p. 236.

[88] *Ibid.*, p. 475.

[89] The *Progressive Farmer* notes that "the average increase in value of vegetables from 12 tons manure per acre was $43 for each ton applied," and that "12 tons of manure accounted for a gain of nearly 9 tons of vegetables." "Big Returns from Manure," *Progressive Farmer*, January 1954, p. 28.

[90] H. J. Snider, "He Gets Paid Off in Manure," *Hoards' Dairy-Man*, 25 January 1952, p. 83.

[91] Loyal Durand, Jr., and Elsie Taylor Bird, "The Burley Tobacco Region of the Mountain South," *Economic Geography*, Vol. 26, 1950, pp. 274-300; reference on pp. 288-289.

[92] In the northeast Georgia broiler area, for instance, rich chicken manure is given to anyone who will clean the houses, and chicken manure is discarded as a useless by-product at a leading Southeastern agricultural experiment station. When they asked a Southeastern dairy farmer what use he made of his manure, the authors were offered all they could carry away as the farmer was eager to be rid of it.

[93] Professor Matthias Stelly of the University of Georgia Agronomy Department informs the authors that in Louisiana only twenty years ago schoolboys were assigned the afternoon chore of collecting dried cow dung in pastures. This was spread on unfenced crop land for fertilizer.

[94] Richard M. Highsmith, Jr., and Elbert E. Miller, "Open Field Farming in the Yakima Valley, Washington," *Economic Geography*, Vol. 28, 1952, pp. 74-87; reference on p. 85. Professor Richard F. Logan informs the authors that a Los Angeles company selling manure for horticultural purposes employs a sultry-voiced female radio announcer who cooes "Bandini is the word for steer manure," at station breaks.

[95] It has been suggested that the development of a zone of intensive horticulture around many European cities was at least partially influenced by the availability of large quantities of night soil, although proximity to market is presumably of greater importance.

Many American farmers do not appreciate the true value of manure, as evidenced by wasteful methods of collection, storage, and distribution. American laymen, including many geographers, have also ignored the importance of manure, and have even tended to make it a subject of ridicule and social impropriety. We might all remember that "the value of manure is slightly over $7.50 per ton! This should be of considerable consolation to the man loading manure by hand,"[96] just as manure is of considerable importance to anyone interested in maintaining the fertility of our soils and in increasing our food production.

[96] Snider, *op. cit.*, [see footnote 90, above], p. 83.

The Jurisdiction of the Federal Power Commission Over The Field Prices of Natural Gas

By RICHARD W. GABLE*

THE Washington Symphony of Natural Gas is being played in counterpoint. The theme was set by Congress. Contrapuntal melodies echoed from the hearing rooms of the Federal Power Commission and the courts, but the harmony was sometimes discordant. Congress responded with efforts to introduce variations on the original theme.

At issue is the authority of the Federal Power Commission under the Natural Gas Act[1] to regulate the field prices paid by interstate pipe-line companies to the producers and gatherers of natural gas. After the Commission ruled that it does not have jurisdiction under the Act to regulate the field prices of independent producers and gatherers, the Supreme Court decided that it does have the authority to regulate such prices in the case of the Phillips Petroleum Company.[2] The Congressional campaign to amend the Natural Gas Act depriving the Commission of regulatory power over field prices, which had been temporarily halted in 1951 by a Presidential veto, was resumed in the last session of Congress. The House of Representatives passed the amendment by the narrow margin of 209 to 203. The Senate will be faced with the necessity of passing on the merits of this proposal in the second session of the Eighty-fourth Congress.

The stakes are high and the final decision will have far-reaching effects.[3] To understand the controversy it is necessary to analyze the events and issues that have preceded the current Congressional battle. First, a brief description of the natural gas industry is helpful to appreciate the special regulatory problems that have arisen.

The Natural Gas Industry and the Problem of Regulation

The role of the federal government in the regulation of the natural gas industry is complicated by its organization into several distinct phases which separate production from ultimate public consumption. Natural gas is produced from both gas and oil wells. Originally gas was discovered in conjunction with oil, so-called casinghead gas, and was regarded as a nuisance, except for its use in raising oil to the surface. It was therefore usually vented or flared. Casinghead gas must be separated from the oil in a trap or separator.

The gas from a number of wells is then assembled through a network of gathering pipe lines which connect with a common line designed to convey it to a transportation pipe line or a processing plant. Except for that gas which is vented at the wells or used in certain field operations, substantially all gas is processed to remove nuisances, such as water and sulfur compounds, and to extract valuable by-products. Processing is a distinct operation from gathering. It may be performed along the gathering line by the company which may collect gas from its own wells as well as from

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[1] 52 *Stat.* 821 (1938).

[2] *Phillips Petroleum Co.*, 10 F.P.C. 246 (1951); *Phillips Petroleum Co.* v. *State of Wisconsin*, 74 S.Ct. 794 (1954).

[3] It has been estimated that 5-cent-per-1000-cubic-feet increase in the field price of natural gas, based upon the sales in the 7 Southwestern states alone, would amount to $116,000,000 a year. Over the life of these reserves (estimated at 30 years) this would amount to $3,480,000,000 additional income before taxes in this area alone. 96 *Cong. Rec.* 3780.

those of other producers or it may be performed along the production line.

The next major phase of the natural gas industry is the transportation of natural gas from well-heads, termini of gathering lines, or tail-gates of processing plants to local distribution companies. Some pipe-line companies own their own natural gas reserves and produce and gather from these properties all the gas they transport and sell. Others purchase from producing companies all the gas they transport and sell, while some produce gas from their own wells and purchase the rest of their requirements from other producers. Pipe-line companies which combine production and gathering with transportation are referred to as "integrated" companies. Producers or gatherers which are unaffiliated with pipe-line companies and sell their gas to the transportation companies in arm's-length transactions are called "independent" producers. The latter term has nothing to do with the size of the company; some of the largest producers in the country are "independents." In fact, the "independents" now own over 90 percent of the gas reserves of the nation.[4]

The local distribution of natural gas to the ultimate consumer is the final phase of the industry. Because of the multiphase character of the natural gas industry there are three different marketing transactions. First, there are the sales by the producer at the well-head, or by producers or gatherers at the termini of their gathering lines, or by processors at the tail-gates of the processing plants to gatherers, processors, and transmission companies. The rates at all these points are called "field prices." Second, there are the sales at wholesale by transportation companies to the local distribution companies, in which the prices are called "city-gate rates." Third, there are the retail sales by the distributing companies to the ultimate consumers.

The constitutional limitations of federalism impose a legal framework within which state and federal regulation of rates and charges in these transactions must be confined. Almost without exception the controls the states have imposed at the production end of the natural gas industry have been to conserve natural resources.[5] The constitutionality of state conservation laws has frequently been upheld.[6]

At the other end of the natural gas industry retail sales have long been subject to state regulation because the business of serving the ultimate consumer has been held to be affected with a public interest. Entry into business, standards of service, and rates and charges of distributing companies have been closely supervised.

However, the city-gate rates charged by interstate pipe-line companies were found to be beyond the jurisdiction of the states because of the constitutional restraints which prevent state regulation from burdening interstate commerce.[7] Consequently, a broad segment of the natural gas industry between production and local distribution went unregulated.

[4] 96 *Cong. Rec.* 4008.

[5] For a detailed discussion of state conservation laws, see F.P.C., *Natural Gas Investigation*, Smith-Wimberly Report (1948), pp. 121-154.

[6] *Ohio Oil Co.* v. *Indiana*, 177 U.S. 190 (1900); *Champlin Refining Co.* v. *Corp. Com.*, 286 U.S. 210 (1932); *Thompson* v. *Consolidated Gas Utilities Corp.* 300 U.S. 55 (1937); *Corzelius* v. *Harrel*, 186 S.W. (2d) 961 (1945).

[7] *West* v. *Kansas Natural Gas Co.*, 221 U.S. 229 (1911); *Haskel* v. *Kansas Natural Gas Co.*, 224 U.S. 217 (1912); *P. U. Com.* v. *Landon*, 249 U.S. 236 (1918); *Penna.* v. *W. Vir.*, 262 U.S. 553 (1923); *Missouri* v. *Kansas Natural Gas Co.*, 265 U.S. 298 (1924).

The Natural Gas Act of 1938

Congress enacted the Natural Gas Act to fill this gap.[8] The regulatory authority under the Act was vested in the Federal Power Commission. The jurisdiction of the Commission was specified in Section 1(b):

"The provisions of this Act shall apply to the transportation of natural gas in interstate commerce, to the sale in interstate commerce of natural gas for resale for ultimate public consumption for domestic, commercial, industrial, or any other use, and to natural-gas companies engaged in such transportation or sale, but shall not apply to any other transportation or sale of natural gas or to the local distribution of natural gas or to the facilities used for such distribution or to the production or gathering of natural gas."[9]

The controversy over the jurisdiction of the Federal Power Commission turns on the interpretation of Section 1(b). It does not make clear whether field prices are to be regulated by the Commission or are freed from regulation by the exempting clause.

A sale to an interstate transportation company, either at the well-head, or after gathering, or at the tail-gate of a processing plant, is clearly a ". . . . sale in interstate commerce of natural gas for resale for ultimate public consumption."[10] But, does the exempting clause of Section 1(b) remove these sales from the coverage of the Act? Congress did not define "production or gathering." Does "production" refer only to the physical activities of raising gas to the surface and separating casinghead gas from oil, or does it also include the sale of gas after production? Where does "gathering" and "transportation of natural gas in interstate commerce" begin? Moreover, no mention was made of the processing phase of the industry in the Act. Is processing to be regarded as a part of "production or gathering" or as a separate and distinct operation which is not a part of production or gathering? In regulating city-gate sales, which are clearly within the Commission's jurisdiction, the Commission must consider the prices the pipe-line companies pay for natural gas. But, does the Commission also have the authority to regulate those prices?

Answers to these questions can be sought in a study of the intent of Congress as seen in the legislative history of the Natural Gas Act, the opinions and official statements of the Federal Power Commission, and the interpretations of the courts.

Intent of Congress

A review of the legislative history of the Natural Gas Act and predecessor bills[11] indicates that the question of regulating the field prices of natural gas received almost no attention. The major concern of Congress was to provide the necessary regulation of interstate pipeline companies, the transportation of natural gas by these companies, and the wholesale sale of natural gas in interstate commerce.

[8] The general purpose of the Act was set forth in Sec. 1(a): ". . . . the business of transporting and selling natural gas for ultimate distribution to the public is affected with a public interest, and that Federal regulation in matters relating to the transportation of natural gas and the sale thereof in interstate and foreign commerce is necessary in the public interest."

[9] A "natural-gas company" was defined as ". . . . a person engaged in the transportation of natural gas in interstate commerce, or the sale in interstate commerce of such gas for resale." (Sec. 2[6]) ("Interstate commerce" was defined as ". . . . commerce between any point in a State and any point outside thereof, or between points within the same State but through any place outside thereof, but only in so far as such commerce takes place in the United States" (Sec. 2 [7]). The Commission was authorized to regulate the sale rates of natural-gas companies. Sec. 5(a).

[10] "Where goods are purchased in one state for transportation to another, the commerce includes the purchase quite as much as it does the transportation" (*Dahnke-Walker Milling Co.* v. *Bondurant*, 257 U.S. 282 [1921], at 291). See also, *U.S.* v. *Rock Royal Co-op.*, 307 U.S. 533 (1939), at 568.

[11] H.R. 5423, 74th Cong., 1st sess., Feb. 6, 1935; H.R. 11662, 74th Cong., 2d sess., Mar. 6, 1936; H.R. 12680, 74th Cong., 2d sess., May 12, 1936; H.R. 4008, 75th Cong., 1st sess., Jan. 29, 1937; H.R. 5711, 75th Cong., 1st sess., Mar. 17, 1937; H.R. 6586, 75th Cong., 1st sess., April 22, 1937.

The contention that Congress intended to exempt the sales of producers or gatherers, as well as production and gathering, rests largely on the testimony given by Dozier A. DeVane, solicitor for the Federal Power Commission, on a predecessor bill which was significantly different from the law as enacted.[12] The Commission used the testimony of DeVane to support the opinion that it has no jurisdiction over the sales made by independent producers and gatherers to interstate pipe-line companies.[13] However, the Court of Appeals for the Fifth Circuit rejected an argument denying the Commission jurisdiction over sales by producers or gatherers based on the legislative history of this predecessor bill and DeVane's testimony on that bill. The Court of Appeals said: "Certainly the legislative history of a bill that was not adopted cannot be resorted to construe a bill that was."[14] The court noted that from the time the bill was introduced to the passage of the Natural Gas Act, the jurisdictional section of the bill was markedly altered indicating that the ideas of the framers of the Act underwent change. Likewise, the Supreme Court rejected DeVane's testimony, because it referred to a bill of "much different jurisdiction" and "has little relevance."[15]

The contrary contention that Congress intended to regulate field prices rests primarily on the fact that the report of the Federal Trade Commission on utility corporations[16] was cited in Section 1(a) of the Natural Gas Act as indicating the necessity for federal regulation of natural gas companies. The report recommended:

> "A Federal regulatory law should be enacted applicable to interstate natural gas pipe lines which transport gas for ultimate sale to and use by the public, regulating contracts for purchase of gas to be transported interstate, or regulating rates for carriage or city gate rates at the end of such transportation, or all of these . . . ."[17]

It should be pointed out, however, that the recommendation that "contracts for purchase of gas to be transported interstate" should be regulated was only one of several alternative proposals. The statement of public policy in the first section of the Natural Gas Act may, or may not, have reference to this particular recommendation.

The debates on the Act never focused on the jurisdictional question at issue. Neither Senator Wheeler nor Congressman Lea, chairmen of the Senate and House Committees on Interstate and Foreign Commerce respectively, speaking in reference to the intended exemption of production and gathering, indicated whether field prices were covered by this exemption.

The report of the House Committee on Interstate and Foreign Commerce accompanying the Natural Gas Bill[18] reveals somewhat more about the intent of

[12] DeVane stated: "Now, section 1(b) also provides that the Commission shall have no jurisdiction over the gathering or gathering rates for natural gas." When asked the meaning of "gathering rates," DeVane replied: "The rates that are paid in the gathering field." (Hearings before a Subcommittee of the Committee on Interstate and Foreign Commerce, House of Representatives, on H.R. 11662, 74th Cong., 2d sess. [1936], p. 28). DeVane responded similarly at other points in the same hearing, at pp. 34, 42-43. However, the bill on which DeVane was testifying based federal jurisdiction on the distinction between high- and low-pressure mains. The provisions of this bill were to apply to the transportation of natural gas in high-pressure lines in interstate commerce and natural-gas companies engaged in such transportation. No mention was made of their applicability to sales of natural gas in interstate commerce.

[13] *Columbian Fuel Corp.*, 2 F.P.C. 200 (1940), at 205; *Phillips Petroleum Co.*, 90 PUR (NS) 325 (1951), at 338-339.

[14] *Interstate Natural Gas Co.* v. *F.P.C.*, 156 F. (2d) 949 (1946), at 952.

[15] *Phillips Petroleum Co.* v. *State of Wisconsin*, 74 S.Ct. 794 (1954), at 799.

[16] *Utility Corporations*, S. Doc. 92, 70th Cong., 1st sess. (1928-1936), Pt. 84-A (1935).

[17] *Ibid.*, pp. 616-617.

[18] H. Rep. No. 709, 75th Cong., 1st sess. (1937). S. Rep. 1162, 75th Cong., 1st sess. (1937) is identical with the House Report.

the framers than any other evidence that is available. The report stated:

"The States have, of course, for many years regulated sales of natural gas to consumers in intrastate transactions. The States have also been able to regulate sales to consumers even though such sales are in interstate commerce, such sales being considered local in character and in the absence of congressional prohibition subject to State regulation . . . . There is no intention in enacting the present legislation to disturb the States in their exercise of such jurisdiction. However, in the case of sales for resale, or so-called wholesale sales, in interstate commerce (for example, sales by producing companies to distributing companies) the legal situation is different. Such transactions have been considered to be not local in character and, even in the absence of congressional action, not subject to State regulation. (See *Missouri* v. *Kansas Gas Co.* [1924], 265 U.S. 298, and *Public Service Commission* v. *Attleboro Steam & Electric Co.* [1927], 273 U.S. 83.) The basic purpose of the present legislation is to occupy this field in which the Supreme Court has held that the States may not act."[19]

The term "distributing companies" in the parenthetical example is a peculiar one if the House Committee was referring to sales by producers to *transportation* companies, i.e., field sales to interstate pipe lines. Both of the Supreme Court decisions cited involved companies that sold their production in interstate commerce directly to local distributing companies. If these were the only activities beyond state authority against which the Act was directed, the jurisdiction of the Commission would not extend to sales by producers or gatherers to interstate transportation companies. However, the Report further stated: "The bill takes no authority from State commissions, and is so drawn as to complement and in no manner usurp State regulatory authority . . . ." being designed ". . . . to fill the gap in regulation that now exists by reason of the lack of authority of the State commission."[20] Similar statements were made by both chairmen of the House and Senate Committees on Interstate and Foreign Commerce during floor debate.[21]

The significance of these statements in conveying the intent of Congress is, therefore, dependent upon the extent of state authority over production and gathering. Prior to 1938, state regulation of production and gathering of natural gas was directed toward its conservation and no attempt was made to fix the rates and charges of field sales. In passing the Natural Gas Act, Congress sought to regulate only that segment of the natural gas industry which could not be reached by the states by reason of the lack of authority of the state commissions. The absence of state regulation of field prices is, of course, no proof of a lack of constitutional power. The competence of state police power may encompass regulation of the wholesale sales of natural gas at the well-head, the terminus of intrastate gathering lines, and the tailgate of the processing plant, where such plant is located within the producing state.[22]

However, the Supreme Court has held that the gap Congress closed in enacting the Natural Gas Act began where state regulation ended *in 1938.* The Court said, in 1950: ". . . . . *prior* constitutional decisions, not what we have since decided or would decide today, form the measure of the gap which Congress intended to close by this act."[23]

Finally, the House Report explained the purpose of the exempting clause in the Act. It has been argued that even

[19] H. Rep. No. 709, pp. 1-2.

[20] *Ibid.*, pp. 2-3.

[21] 81 *Cong. Rec.* 6721; 81 *Cong. Rec.* 9312.

[22] The action by the state commissions in Oklahoma and Kansas fixing minimum field prices on all sales in the Hugoton field was upheld, *Cities Service* v. *Peerless Oil & Gas Co.*, 220 P.(2d) 279 (1950); *Kansas-Nebraska Natural Gas Co.* v. *State Corp. Com.*, 222 P. (2d) 704 (1950).

[23] *F.P.C.* v. *East Ohio Gas Co.*, 338 U.S. 464 (1950), at 471-472. (Italics in original.)

though field sales might conceivably fall within the affirmative grant of authority in Section 1(b), the effect of the exemption is to remove such sales from the scope of the Act.[24] However, the House Report stated:

"The quoted words [exempting clause] are not actually necessary, as the matter specified therein could not be said fairly to be covered by the language affirmatively stating the jurisdiction of the Commission, but similar language was in previous bills, and, rather than invite the contention, however unfounded, that the elimination of the negative language would broaden the scope of the act, the committee has included it in this bill."[25]

Thus, the House Report accompanying the Natural Gas Bill, while vague and confusing on some points, does make clear that the exemption clause adds nothing to the meaning of the law. However, the Report does not contain conclusive evidence that, because the states had not attempted to regulate field sales, such sales were within the gap being closed by federal regulation. Neither does it contain conclusive evidence that field sales were not regarded as sales in interstate commerce.

Only DeVane's testimony *on a predecessor bill* made specific reference to field sales, which he contended were not to be regulated. But, DeVane had no part in the preparation of the bill he was explaining, beyond the work he had done on the Federal Power Act, after which this bill was modeled. Moreover, he did not appear as a representative of the Commission and was presenting no official interpretation.[26]

The judgment of this writer is that the legislative history of the Act does not reveal conclusively whether Congress intended field sales to interstate pipe-line companies to be regulated or exempt from regulation. Hence, interpretations of the Natural Gas Act in regard to the issue in question cannot derive support from the intent of Congress. Perhaps Congress was purposely vague to allow greater flexibility in the administration of the law. Or, possibly the issue was not a subject of concern to Congress and therefore no position was taken on the matter.

FPC and Court Interpretations

The sometimes conflicting opinions and official statements of the Federal Power Commission and of the courts regarding Commission jurisdiction under the Natural Gas Act reflect the uncertainties about the intent of Congress.

The Columbian case.[27] A question of the Commission's jurisdiction over field prices was raised for the first time in 1940. The Columbian Fuel Corporation was a producer which sold natural gas to an interstate transportation company at the termini of its gathering lines and at the tail-gate of a compressor station which it owned. The Commission was convinced that the affirmative language of the Act clearly made a company like Columbian a natural-gas company, subject to the jurisdiction of the Commission. But, the Commission decided that the exempting clause made it necessary to rule that Columbian was not within the scope of the law.[28]

The Commission listed three reasons for not determining in favor of a broader

[24] See, for example, Smith-Wimberly Report, *op. cit.*, p. 156.

[25] H. Rep. No. 709, p. 3.

[26] Hearings on H.R. 11662, *op. cit.*, pp. 10, 35.

[27] *Columbian Fuel Corp.*, 2 F.P.C. 200 (1940).

[28] *Ibid.*, at 203. The Commission held that ". . . . it was not the intention of Congress to subject to regulation under the Natural Gas Act all persons whose only sales of natural gas in interstate commerce, as in this case, are made as an incident to and immediately upon the completion of such person's production and gathering of said natural gas and who are not otherwise subject to the jurisdiction of this Commission" (at 203). The words "incident to" were not a part of the Act's legislative history. Moreover, in 1939, the Commission rejected the contention of a pipe-line company that it was not a natural-gas company within the meaning of the Act because all its transmission activities were "incident" to its local distribution. *East Ohio Gas Co.*, 1 F.P.C. 586.

interpretation of its jurisdiction: (1) lack of sufficient machinery and appropriations, (2) the belief that the Commission's authority would thereby be extended to other aspects of producing or gathering, and (3) the intent of Congress.

The first reason is not based on an interpretation of Section 1(b) but is a practical reason for not exercising authority even if the Commission possessed it. The second reason is fanciful. The Commission itself recognized that Section 1(b) is not an absolute exemption of all aspects of production or gathering.[29] The contention that Congress specifically intended to exempt the sales of independent producers and gatherers, as well as production and gathering, is not conclusive, as has already been documented. The reasoning of the majority in this opinion is important because it was cited in all subsequent opinions in which the Commission refused jurisdiction over the field prices paid to independent producers or gatherers by interstate pipeline companies.

Commissioner John W. Scott dissented and Leland Olds, who voted with the majority, later regretted that he had not dissented.[30] Scott argued that regulation of field prices still left many production and gathering activities outside the scope of the law; for example, the field use of natural gas by the producer, the sale to nearby manufacturers of carbon black, or the production and gathering for local distribution or sale in intrastate commerce.

The Billings case.[31] In another case the same year the Commission assumed jurisdiction under the Act over the sales for resale by companies that produce and gather natural gas and then transport it across state lines for resale to ultimate consumers. The opinion was unanimous.

Although there is no field sale in the usual sense in the case of so-called integrated companies, the effect of this decision is to permit the Commission to fix the costs that can be allowed for production and gathering. Regulation is accomplished in the following manner. Production and gathering are treated as part of total operations, and the city-gate price that may be charged is a specific rate of return calculated on the original cost minus depreciation and depletion adding allowance for working capital.[32] The full cost of producing and gathering operations are allowed, including all exploration and development costs, such as drilling of dry holes, delayed rentals, abandoned leases, royalties, and the like. For gas entering interstate pipe lines from independent producers or gatherers under arm's-length contracts, the Commission allows the entire unregulated price paid by the pipe-line company as the cost to be included in the determination of reasonable rates for sales subject to its jurisdiction.

In the Columbian and Billings cases the Commission attempted to develop jurisdictional criteria: if the gas were transported in interstate commerce after completion of production and gathering, the Commission has jurisdiction over the

[29] For example, Sec. 9 authorized the Commission to determine the rates of depreciation and amortization of several classes of property, including property used and useful in "production," as well as that used in transportation and sale. Sec. 10 authorized the Commission to require reports, including, among others, reports on "cost of facilities, cost of maintenance and operation of facilities for the production, transportation, or sale of natural gas." And Sec. 14 authorized the Commission to determine the adequacy or inadequacy of the gas reserves held or controlled by any natural-gas company, or by anyone on its behalf.

[30] Hearings before a Subcommittee of the Committee on Interstate and Foreign Commerce, House of Representatives, on H.R. 79, H.R. 1758, and H.R. 982, 81st Cong., 1st sess. (1949), p. 17.

[31] *Billings Gas Co., Ohio Oil Co., and Mountain Fuel Supply Co.*, 2 F.P.C. 288 (1940).

[32] In 1954 the F.P.C. apparently abandoned the original cost of reserves as a rate-fixing base in favor of "fair field value;" i.e. production was treated as a going commodity rather than as ordinary utility property. *Panhandle Eastern Pipe Line Co.*, Docket No. G-1116, Opinion No. 269, April 15, 1954.

city-gate sale and consequently can fix the allowable costs for production and gathering; otherwise, it does not. These cases did not reach the courts.

The Peoples case.[33] The first court case in which the question of the Commission's jurisdiction over field prices was an issue was decided in 1942. A finding of jurisdiction over a company which produced and transported natural gas in interstate commerce was sustained by the Court of Appeals for the District of Columbia. However, the opinion of the court did not rely on the Commission's criteria developed in the Columbian and Billings cases but implied that the Commission had jurisdiction simply because the sale was in interstate commerce. There was nothing about the *facts* in the Peoples case which disturbed the Commission's criteria because gas was transported in interstate commerce after the termination of production and gathering. But, the Court of Appeals did say, in regard to the Columbian case: "We cannot disregard the plain language of the statute because the Commission at one time interpreted it narrowly."[34]

The Colorado Interstate case.[35] The first Supreme Court case in which a jurisdictional question under Section 1(b) was raised by the participants involved the sales of Canadian River Gas Company.[36] Canadian River produced natural gas from its own wells and sold the chief portion of it to Colorado Interstate Gas Company, a natural-gas company within the meaning of the Act. The two companies were operated as an integrated enterprise. In determining the rate at which Colorado Interstate could sell in interstate commerce for resale, the Commission included in the rate base Canadian River's producing and gathering properties as well as Colorado Interstate's transmission system.

The Supreme Court upheld the Commission's action as not being in violation of Section 1(b) while recognizing that this determination would have an indirect effect on production properties and gathering facilities.[37] However, the Court pointed out that that does not mean that Section 1(b) has no meaning: "Certainly that provision precludes the Commission from any control over the activity of producing or gathering natural gas. For example, it makes plain that the Commission has no control over the drilling and spacing of wells and the like. It may put other limitations on the Commission."[38]

What the "other limitations" might be the Court did not elaborate. It is important to note that the Court made a distinction between the physical activity of producing or gathering and sales at the conclusion of producing or gathering.

The Interstate case. A complicated problem confronted the Commission in the complex operations of the Interstate Natural Gas Company.[39] Interstate owned and operated a natural gas system consisting of gas wells in Louisiana, pipe lines which gathered the gas produced from its own wells and gas purchased from other producers, and pipe lines which transported substantially all of that gas in interstate commerce.

The jurisdictional question raised in this case involved the wholesale sales

[33] *Peoples Natural Gas Co.* v. *F.P.C.*, 127 F. (2d) 153 (1942); cert. denied, 316 U.S. 700 (1942).

[34] *Ibid.*, at 155.

[35] *Colorado Interstate Gas Co.* v. *F.P.C.; Canadian River Gas Co.* v. *same*, 324 U.S. 581 (1945).

[36] In *F.P.C.* v. *Hope Natural Gas Co.*, 320 U.S. 591 (1944), West Virginia, appearing as amicus curiae, argued that the Federal Power Commission has no authority to include production or gathering facilities in a rate base or to include gathering and production expenses in operating expenses. This issue was not raised by any party to the suit but the argument was rejected. At 607-615, esp. at 614, n. 25.

[37] The Court ruled similarly in two other cases the same year. *Colorado-Wyoming Gas. Co.* v. *F.P.C.*, 324 U.S. 626 (1945); *Panhandle Eastern Pipe Line Co.* v. *F.P.C.*, 324 U.S. 635 (1945).

[38] 324 U.S. 581, at 602.

[39] *Interstate Natural Gas Co.*, 3 F.P.C. 416 (1943).

Interstate made entirely within Louisiana to three interstate pipe-line companies only one of which was affiliated with Interstate. A large portion of the gas sold to the three companies was purchased from other companies which first gathered and transported it to central delivery points for sale to Interstate. This gas was commingled with gas Interstate produced and gathered and was transported to the point of sale and delivery in Louisiana to the three pipeline companies. The gas then proceeded to flow in interstate commerce. The Commission held that the sales were made after the gas had started on the interstate journey, not at the completion of the producing and gathering phase, and therefore fell within Commission jurisdiction.

It appears in this case that the Commission abandoned the criteria developed in the Columbian and Billings cases and in effect adopted the reasoning of the dissenting opinion in the Columbian case. The Commission found support for this position in the decision of the Court of Appeals in the Peoples case in which the basis for the holding was the fact that the sale was in interstate commerce.

The Commission's assumption of jurisdiction over the sales by the Interstate Natural Gas Company to three interstate pipe-line companies was sustained by the Court of Appeals for the Fifth Circuit.[40] The Court of Appeals said that Interstate mistakenly read the exemption with respect to producing and gathering in Section 1(b) as an exemption with respect to sales. There is no warrant in the Act for doing so, the Court of Appeals explained:

"Under familiar rules of construction, a negation in or exception to a statute will be construed so as to avoid nullifying or restricting its apparent principal purpose and the positive provisions made to carry them out."[41]

The principal purpose of the statute is to regulate the ". . . . sale in interstate commerce of natural gas for resale for ultimate public consumption." The exemption clause is perhaps unnecessary, the Court of Appeals continued:

". . . . but in the interest of making clear that the act gave jurisdiction only over sales and transportation of the kind described in it, it used language removing from any doubt that the Commission was not to have jurisdiction over *properties* used for production and local distribution and the *activities* of production and gathering."[42]

The Supreme Court, in a review limited to the question of jurisdiction, unanimously upheld the lower court.[43] These sales came within the scope of the law, the Court said, because:

"by the time the sales are consummated, nothing further in the gathering process remains to be done . . . . Unreasonable charges exacted at this stage of the interstate movement become perpetuated in large part in fixed items of cost which must be covered by rates charged subsequent purchasers of gas including the ultimate consumer. It was to avoid such situations that the Natural Gas Act was passed."[44]

As in the Colorado Interstate case, the Court explained that Section 1(b) is not meaningless. The same examples of the activities beyond federal control were given:

"Clearly, among the powers thus reserved to the States is the power to regulate the *physical production and gathering of natural gas in*

[40] *Interstate Natural Gas Co.* v. *F.P.C.*, 156 F. (2d) 949 (1946).

[41] *Ibid.*, at 951.

[42] *Ibid.* (Italics added.)

[43] *Interstate Natural Gas Co. v. F.P.C.*, 331 U.S. 682 (1947).

[44] *Ibid.*, at 692-693. The Court recognized that the Federal Power Commission has not asserted jurisdiction over all sales taking place in natural gas fields even though they are in interstate commerce for resale for ultimate public consumption, as in the Columbian case. The Court expressed ". . . . no opinion as to the validity of the jurisdiction tests employed by the Commission" in such cases. At 691, n. 18.

the interests of conservation or of any other consideration of legitimate local concern."[45]

Then, in language going beyond the facts in the case, the Supreme Court asserted that "exceptions to the primary grant of jurisdiction in the section [section 1(b)] are to be strictly construed."[46] As a test for determining when exceptions should be granted to Commission jurisdiction over sales in interstate commerce under the Natural Gas Act the Court suggested:

". . . . where sales, though technically consummated in interstate commerce, are made during the course of production and gathering and are so closely connected with the local incidents of that process as to render rate regulation by the Federal Power Commission inconsistent or a substantial interference with the exercise by the State of its regulatory functions, the jurisdiction of the Federal Power Commission does not attach. But such conflict must clearly be shown."[47]

The Campaign to Amend the Natural Gas Act

The decision of the Federal Power Commission in the Interstate case and the ruling of the Court of Appeals sustaining it triggered a campaign to amend the Natural Gas Act. Even before review by the Supreme Court Congressman Rizley introduced amendatory legislation early in 1947 and was joined by Carson and Davis, who placed identical bills in the hopper.[48] On July 1, 1947, Rizley substituted H.R. 4051 for these three bills and it quickly passed the House of Representatives on July 11, 1947. The Rizley bill would amend Section 1(b) to exempt any transportation and sale of natural gas between the producing well and the point of its delivery to or reception in the interstate transportation pipe line and any sale thereof or prior to such point of delivery or reception. The sales by both independent producers or gatherers and integrated companies would thus be removed from Commission jurisdiction.[49] The Commission opposed H.R. 4051 on the ground that Congress should await the outcome of the natural gas investigation being conducted at that time by the Commission.[50] However, the Commission (consisting of Olds, Draper, Smith, and Wimberly, with one vacancy) did unanimously approve and urge the enactment of a less comprehensive bill introduced by Congressman Priest on July 19, 1947 (H.R. 4099) which would have exempted only the sale of natural gas at arm's length by independent producers to interstate pipe lines.[51]

The companion to H.R. 4051 (S. 734) was introduced in the Senate by Senator Moore[52] but was defeated in the Committee on Interstate and Foreign Commerce. Congress adjourned on July 26, 1947, without passing any amendatory legislation.

Apparently prompted by this failure, the Federal Power Commission issued Order No. 139 on August 15, 1947.[53] In this order the Commission announced that it would:

". . . . construe the exemption contained in Section 1(b), to the effect that the provisions of the Act shall not apply to the 'production or gathering' of natural gas, as including arm's-length sales of natural gas by independent producers and gatherers, made during the course or upon completion of production and gathering."

[45] *Ibid.*, at 690. (Italics added.)
[46] *Ibid.*, *at* 691.
[47] *Ibid.*
[48] H.R. 2185, H.R. 2235, and H.R. 2292, respectively, 80th Cong., 1st sess. (1947). 93 *Cong. Rec.* 1410, 1480, 1518. Hearings on these bills were held by the Committee on Interstate and Foreign Commerce, House of Representatives.
[49] 93 *Cong. Rec.* 8055, 8733.
[50] Hearings before House Committee on Interstate and Foreign Commerce on H.R. 2185, 2235, 2292, and 2956, 80th Cong., 1st sess. (1947), p. 10.
[51] Letter by F.P.C. to Chairman Wolverton, House Committee on Interstate and Foreign Commerce, July 10, 1947, reproduced in Hearings before a Subcommittee of the Committee on Interstate and Foreign Commerce on S. 1498, 81st Cong., 1st sess. (1949), p. 91.
[52] 93 *Cong. Rec.* 1526.
[53] Docket No. R-106.

Commissioner Draper opposed the issuance of Order No. 139, or any order ". . . . which might be interpreted to constitute a legal limitation upon its [the Commission's] power." He argued that the order went beyond the rule outlined in the Supreme Court's decision in the Interstate case because it renounced authority over ". . . . all sales in interstate commerce made at arm's-length by independent producers and gatherers, whether or not they are inconsistent with State regulatory powers." He felt that this exemption should come from Congress, not from the Commission, and pointed out that the Commission was not unaware of the need for Congressional action, because, in setting forth the order, the Commission recommended the enactment of a new law to amend and clarify Section 1(b). He concluded: ". . . . the Commission should hesitate to do by rule what Congress has failed to do by law."

At the conclusion of the natural gas investigation in 1948 two reports were issued by the Commission. Commissioners Smith and Wimberly agreed that: ". . . . Congress should adopt amendatory legislation to make it clear that independent producers or gatherers of natural gas, and their sale thereof to interstate pipe lines, are not subject to the provisions of the Natural Gas Act."[54] Commissioners Draper and Olds, in a separate report, now contended that the Act should not be amended in any way.[55] Although the debate continued through 1948 no further legislative action was taken. At one point Senator Moore delivered a speech which presaged the bitterness of the battle in the next session of Congress. He asserted that the Moore-Rizley bill was the object of ". . . . a well-planned and well-executed propaganda program of the Red element in the United States under the leadership of Leland Olds . . . ."[56]

On January 24, 1949, Congressman Harris introduced amendatory legislation in the House of Representatives (H.R. 1758)[57] and, at the request of the Oklahoma legislature, Senators Kerr and Thomas introduced S. 1498 on April 4, 1949.[58] The House bill was reported from committee on July 19, 1949 and, in rapid order, the House report was filed on July 28, the bill was brought up under limited debate, and passed on August 5, by a vote of 183 to 131.[59]

The Kerr-Thomas-Harris measures, much like the Priest bill of 1947, would exempt from Commission regulation the sales by independent producers to interstate pipe lines. The Commission, which (with one vacancy) had unanimously endorsed the Priest bill in 1947, and which split two to two in the Natural Gas Investigation Report in 1948, now (with the appointment of Buchanan) directed majority opposition to this legislation. Commissioner Olds offered some of the most vigorous testimony against it before both House and Senate Committees on Interstate and Foreign Commerce in spite of the fact that his reappointment was to come before the Senate Committee for confirmation within the next three months. In an endeavor to break the majority opposition of the Commission

[54] Smith-Wimberly Report, *op. cit.*, pp. 40-41.

[55] Olds-Draper Report, *op. cit.*, p. 12. (Since there was one vacancy on the Commission at the time it was not possible to arrive at a majority report.) After both Olds and Draper had endorsed the Priest bill and Olds, though not Draper, joined in issuing Order No. 139, they now opposed the Smith-Wimberly report and, during 1947 and 1950, the Kerr bill which was substantially the same as the Priest bill. A possible explanation for this change of positions is that the natural gas investigation revealed information pointing to the need for Commission regulation of all field sales.

[56] 94 *Cong. Rec.* 8555.

[57] 95 *Cong. Rec.* 531; also introduced were H.R. 79, by Lyle, 95 *Cong. Rec.* 79, and H.R. 982, 95 *Cong. Rec.* 96. Hearings were held on all three of these bills during 1949 by the House Committee on Interstate and Foreign Commerce.

[58] 95 *Cong. Rec.* 3776. Hearings were held on S. 1498 before a Subcommittee of the Committee of the Senate Committee on Interstate and Foreign Commerce during 1949.

[59] 95 *Cong. Rec.* 10871.

to such amendatory legislation and deliver a personal rebuff to Olds, gas and oil interests joined forces with the proponents of the legislation in the Senate to defeat Olds' confirmation. Rarely has such vicious and bitter debate over a confirmation been heard in the Senate. Olds was charged with being a Communist, a socialist, anti-religious, unpatriotic, and what was true—an opponent of the effort to amend the Natural Gas Act. In spite of the defense that was provided by many eminent persons who testified to Olds' honesty, integrity, and ability, his reappointment was not approved.[60] The appointment of Mon C. Wallgren in his place was subsequently approved.

In the second session of the 81st Congress, H.R. 1758 passed the Senate, in lieu of S. 1498, on March 29, 1950, by a close vote of 44 to 38.[61] Commissioners Draper and Buchanan, joined by Wallgren, favored a Presidental veto of H.R. 1758, while Smith and Wimberly believed that it should be approved.

President Truman vetoed the bill on April 18, 1950.[62] The President reasoned that the:

". . . . authority to regulate such sales is necessary in the public interest . . . . to withdraw entirely from this field of regulation, however, impelled only by imaginary fears, and in the face of a record of accomplishment under the present law which is successful from the standpoint of consumer, distributor, carrier and producer alike, would not be in the public interest."[63]

Because of the President's veto of the Kerr bill, the Federal Power Commission rescinded Order No. 139 on August 17, 1950.[64]

[60] For an excellent discussion see Joseph P. Harris, "The Senatorial Rejection of Leland Olds: A Case Study," *American Political Science Review*, September 1951, pp. 674-692.
[61] 96 *Cong. Rec.* 4304.
[62] 96 *Cong. Rec.* 5304.
[63] *Ibid.*
[64] Order No. 154.

Further FPC and Court Interpretations

Before the all-important Phillips case was decided by the Supreme Court and during the course of the campaign to amend the Natural Gas Act, two cases were handed down by the Court which are relevant to this discussion.

The Panhandle Case.[65] In 1949, the Supreme Court further defined the scope of Commission jurisdiction, without ruling on the field prices issue. The question presented was whether Panhandle Eastern Pipe Line Company, a natural-gas company within the meaning of the Act, might sell natural gas reserves leases without approval of and contrary to an order of the Commission. The Court decided that leases are an essential part of production and, therefore, their sale falls within the exemption in Section 1(b). The majority was careful to point out that the use of data about production properties for rate-making, as permitted in the Colorado Interstate case, was not a precedent for the regulation of any part of production and marketing.

Justices Black, Douglas, and Rutledge dissented. Writing for the minority, Black contended that the decision of the majority ". . . . deprives the Commission of the power to discharge its congressionally imposed duty to protect the public interest."[66] He conjectured:

"It seems inconceivable that Congress would have passed an Act to regulate natural-gas companies with a wholly neutralizing exception to bar regulation of the gas reserves upon which the whole gas business depended. I cannot attribute such a meaningless and deceptive action to the Congress."[67]

The Cities Service case.[68] A 1950 Supreme Court decision is relevant, although the jurisdiction of the Commission

[65] *F.P.C.* v. *Panhandle Eastern Pipe Line Co.*, 337 U.S. 498 (1949).
[66] *Ibid.*, at 517.
[67] *Ibid.*, at 520.
[68] *Cities Service Gas Co.* v. *Peerless Oil and Gas Co.*, 340 U.S. 179 (1950).

under Section 1(b) was not at issue. The Oklahoma Corporation Commission fixed the minimum well-head prices on all gas taken from the Guymon-Hugoton field.[69] Cities Service Gas Company, a producer and operator of an interstate pipe-line system, was ordered to take gas ratably from Peerless Oil and Gas Company, another producer, at prices fixed by the Commission. Cities Service questioned the order as being in conflict with the commerce power of Congress. The Supreme Court held that the commerce power is not exclusive. The states may regulate matters of local concern over which federal authority has not been exercised even though regulation has some impact on interstate commerce.[70] The Court ruled that a legitimate local interest was at stake.

"It is now undeniable that a state may adopt reasonable regulations to prevent economic and physical waste of natural gas . . . . In the proceedings before the commission in this case, there was ample evidence to sustain its finding that existing low field prices were 'resulting in economic waste and conducive to physical waste.' That is a sufficient basis for the orders issued."[71]

A question of possible conflict with the Natural Gas Act was not raised. In any case, the decision does not have the effect of limiting Commission jurisdiction over field prices paid by interstate pipe-lines unless such regulation falls under the Interstate rule. The gap that Congress filled in enacting the Natural Gas Act was the gap that existed in 1938, not the gap that remains after subsequent state regulatory enactments.[72] Moreover, the Oklahoma regulation is of *minimum* prices in the interests of conservation, whereas Commission jurisdiction includes the fixing of *maximum* prices in the broader "public interest."

The Phillips case. The most important in this series of opinions involved the largest producer of natural gas in the nation, the Phillips Petroleum Company. Phillips owned a vast network of pipe lines connecting the many wells it owned or controlled. The function of certain of Phillips' lines was to gather and transport gas to the processing plant. Some of these lines crossed the State border between Oklahoma and Texas before joining with the lines of five natural-gas companies subject to Commission jurisdiction. Phillips contended that gathering does not end until the sale and delivery of natural gas at the tail-gate of the processing plant to the interstate transportation company, and that until the gas connects with a transportation pipe line is not subject to the provisions of the Act.

The Commission agreed with Phillips, finding that ". . . . its operations, so far as relevant, consist of production and gathering, or incidents of or activities related to these functions . . . ."[73] Gathering was defined as ". . . . the function of transporting gas as it is collected from the wells, whether or not the movement is interstate."[74] Furthermore, the Commission reasoned that processing is a part of production and gathering. "The production and gathering of gas do not constitute an end in itself, but a means to an end. Excepting use by the operator, that end usually is

[69] The commission found, after hearing and investigation, that there was no competitive market for gas in Guymon-Hugoton field, that integrated well and pipe-line owners were able to dictate prices paid to producers without pipeline outlets, and that as a result gas was being taken at a price below economic value. Economic and physical waste of natural gas was a consequence. Therefore, the commission set a minimum price of 7¢ per 1000 cubic feet. *Ibid.*, at 183. The Oklahoma Supreme Court construed a 1915 conservation act to permit the general order setting a minimum field price. 220 P. (2d) 279 (1950).

[70] 340 U.S. 179, at 186. See also *Parker* v. *Brown*, 317 U.S. 341 (1943); *Milk Control Board* v. *Eisenberg Farm Products*, 306 U.S. 346 (1939); *South Carolina Highway Dept.* v. *Barnwell Bros.*, 303 U.S. 177 (1938).

[71] *Ibid.*, at 185-186.

[72] See above, pp. 11-12.

[73] *Phillips Petroleum Co.*, 90 PUR (NS) 325 (1951), at 350.

[74] *Ibid.*, at 339.

the sale of the gas and of products extractable by processing."[75] Therefore, the Commission decided that, in view of the exemption in 1(b), it had no jurisdiction over the complex, widespread, and numerous operations of Phillips.

Phillips' sales were found to be beyond Commission jurisdiction for a second reason. The Commission said that the regulation of these sales would be ". . . . inconsistent or constitute a substantial interference with . . . ." the conservation efforts of the states. By not fixing field prices and allowing higher profits, waste would be discouraged and abandonment of wells would be postponed. Also, the higher the price paid to the producer, the easier it would be for the states to discourage the flaring of gas and to encourage the gathering and marketing of such gas.

Commissioner Draper concurred separately, while Buchanan dissented. Buchanan's disagreement with the first determination of the majority was based on both a question of law and a question of fact. As for the question of law, he argued, on the basis of the legislative history of the Act and of court decisions prior and consequent to the Act, that the sales made by producers or gatherers to interstate pipe lines are subject to the Act.[76] As for the factual question, he maintained that the sales here involved were made by Phillips *after* production and gathering were completed. To define "gathering" Buchanan relied upon the testimony of a natural gas engineer who explained that gathering of gas ends at the point on the main field line where all the gas has come into a common flow, and that the line from such point is a transportation line. Evidence from Phillips' records was used to support the contention that Phillips admitted this distinction between gathering and transportation.[77] The engineer also testified that processing may be performed at other places than in the field and that it is a distinct operation from production and gathering[78] so that anything beyond the point where gas comes into a common flow, including processing, is no longer a part of production or gathering.[79]

The second basis for the majority's decision was attacked by Buchanan for containing no facts or reasons showing a conflict between rate regulation by the Commission and the regulatory functions of the states. Buchanan argued that the answer to the contention of interference with state conservation efforts is found in the fact that there are a number of natural-gas companies which engage in substantial field operations similar to those of Phillips and which are subject to the jurisdiction of both the Commission and state regulatory agencies. Moreover, Buchanan pointed out that there can be no conflict when the states do not regulate these sales. He contended that availability of markets—not price—has been in large part responsible for the saving of casinghead gas that otherwise would be vented or flared. As Phillips

[75] *Ibid.*, at 350-351.

[76] "It is settled law that production, on the one hand, and a sale or transportation in interstate commerce, on the other, are legally distinct activities. *Carter* v. *Carter Coal Co.* (1936) 298 US 238, 302, 303, 80 L. ed. 1160, 56 S. Ct. 855; *United States* v. *Darby* (1941) 312 US 100, 85 L. ed. 609, 61 S. Ct. 451. As they are distinct activities the majority does not explain how they become a 'part of gathering.' " (*Ibid.*, at 365, n. 9).

[77] In a contract between Phillips and Panhandle Eastern, there is a reference to Phillips' "gathering and transportation facilities." In 1940, Phillips testified before the Federal Power Commission that its "construction of gas transmission lines ranging from 15 to 50 miles in length is just ordinary course all the time" and "it is not quite correct to describe" such lines "just as gathering lines from wells." *Ibid.*, at 369.

[78] For example, the Tennessee Gas Transmission Corporation has a processing plant in Kentucky that processes gas transported 1000 miles from Texas and Louisiana.

[79] An example of this distinction was found in the Phillips system. At one plant gas was scrubbed, compressed, treated, for sulfur content, sold and delivered to Panhandle; commingled with other gas produced and gathered by Panhandle and further compressed; and then delivered back to Phillips for additional processing, while ownership was retained by Panhandle. *Ibid.*, at 366-367. The distinction between "gathering" and "processing" was further supported by the technical definitions of the terms. See Hollis P. Porter, *Petroleum Dictionary for Office, Field and Factory*, 4th Ed.

became able to obtain revenues from residue gas, the necessity for flaring diminished, and now has practically disappeared. Hence, rate regulation would not endanger conservation efforts. The Commission's decision in the Phillips case was reversed by the District of Columbia Court of Appeals in May, 1953.[80] The Court of Appeals decided that ". . . . Phillips sells the gas after the time and beyond the place at which production and gathering are complete and after processing has intervened."[81] Therefore, Phillips was found to be a natural-gas company within the meaning of the Act and the Commission was instructed to fix the rates at which these sales are made. The Court of Appeal's decision did not go beyond ruling on a question of fact that Phillips' sales occurred after production and gathering are complete. The general question of law in regard to Commission jurisdiction under the Act was left unanswered.

". . . . the validity or invalidity of the Commission's conclusion that Phillips is not a 'natural-gas company' does not turn upon the evaluation of testimony or upon the generic question whether the exemption of 'production or gathering' in Section 1(b) of the Natural Gas Act covers interstate sales of gas by the corporation that produced and gathered it. We think the Act and the decisions of the Supreme Court permit only one answer. We think the Commission has applied an erroneous rule of law. Phillips' sales to the pipeline companies are not within either the statutory phrase 'the production or gathering of natural gas' or the Supreme Court's paraphrase 'made during the course of production and gathering.' "[82]

The Act, the Court of Appeals wrote, exempts both "local distribution" and "production or gathering," but:

". . . . it exempts nothing between 'production and gathering' and 'local distribution.' The exemption of production and gathering does not exempt sales made after production and gathering have been completed."[83]

On November 30, 1953, the Supreme Court denied certiorari in the case.[84] The Court later reversed itself, granted certiorari,[85] and rendered a decision on June 7, 1954.[86] The Court held:

"In our view, the statutory language, the pertinent legislative history, and the past decisions of this Court all support the conclusion of the Court of Appeals that Phillips is a 'natural-gas company' within the meaning of that term as defined in the Natural Gas Act, and that its sales in interstate commerce of natural gas for resale are subject to the jurisdiction of and regulation by the Federal Power Commission."[87]

In the opinion of the Court, "production and gathering, in the sense that those terms are used in Section 1(b), end before the sales by Phillips occur."[88]

Speaking of the legislative history of the Act, the Court said that it "indicates a congressional intent to give the Commission jurisdiction over the rates of all wholesales of natural gas in interstate commerce, whether by a pipe-line company or not and whether occurring before, during, or after transmission by an interstate pipe-line company."[89] The Act was passed, the Court explained, to fill a gap thought to exist at the time it was enacted and the jurisdiction of the Federal Power Commission is not affected by subsequent decisions of the Supreme Court which have somewhat loosened constitutional restrictions on State activi-

[80] *State of Wisconsin* v. *F.P.C.*, CCH Utilities Law Reporter, Federal, Sec. 9346; 205 F. (2d) 706.

[81] *Ibid.*, at 10,747.

[82] *Ibid.*, at 10,750.

[83] *Ibid.*

[84] *F.P.C.* v. *State of Wisconsin*, 98 L. ed. (Advance p. 150).

[85] *Phillips Petroleum Co.* v. *State of Wisconsin*, 346 U.S. 934-935.

[86] *Phillips Petroleum Co.* v. *State of Wisconsin*, 74 S.Ct.. 794 (1954). Justice Minton wrote the decision; Justice Frankfurter concurred; Justice Douglas dissented, as did Justices Clark and Burton in separate opinions.

[87] *Ibid.*, at 796.

[88] *Ibid.*, at 797.

[89] *Ibid.*, at 800. The testimony of DeVane when the bill was under consideration in the House of Representatives was rejected because it referred to a bill of "much different jurisdiction" and "has little relevance here." At 799.

ties affecting interstate commerce.[90] Regulation of the rates of independent producers, the Court concluded, is not essentially different from the regulation of sales when made by affiliates of interstate pipe-line companies. In both cases the rates have a direct and substantial effect on the price paid by the ultimate consumer.

An aftermath of the Phillips case, which was reminiscent of the Olds incident, occurred in 1952. The Senate refused to confirm the reappointment of Buchanan, the sole dissenter to the Commission's denial of jurisdiction over sales in the Phillips case.[91]

Conclusion

The dispute over the jurisdiction of the Federal Power Commission turns on the different emphasis and interpretation placed on Section 1(b) by the Commission and the courts. The Commission looked to see if there was transportation in interstate commerce before assuming jurisdiction. The courts instead asked if the rates charged were sales in interstate commerce for resale. Since all sales to interstate pipe-line companies are sales in interstate commerce the question then must be answered: does the exempting clause exempt sales by producers or gatherers?

The court's view in the Interstate case was that exceptions to the primary grant of authority should be strictly construed. This judgment was arrived at by considering production and gathering as involving only the physical properties and activities related to raising gas to the surface, separating casinghead gas from oil, and gathering it. Also, in the Panhandle, Colorado Interstate, and Phillips cases the Supreme Court maintained that production and gathering applied to physical activities, facilities, and properties.

The decision in the Panhandle case denying the Commission jurisdiction over the sale of leases, while it may have adverse effects on the public interest and may necessitate further legislation, nevertheless, is not explicitly contradictory of the distinction the Court makes between the physical properties and activities of producing or gathering natural gas and sales in interstate commerce at the conclusion of production or gathering. In both the Colorado Interstate and Interstate cases the courts recognized that the former clearly fall within the limits of state authority while holding that the latter are subject to Commission jurisdiction.

The decision in the Cities Service case upholding state minimum price fixing does not prevent Commission regulation of field prices in interstate commerce because state controls were enforced in the interest of conservation. State conservation regulation is not necessarily inconsistent with federal protection of the public interest.

However, the Supreme Court has not ruled unequivocally on the general question of law of whether all fields sales to interstate transportation companies are subject to Commission jurisdiction. Thus far the Court has confined itself, as in the Interstate and Phillips cases, to ruling on factual questions of whether the sales in specific cases occurred after production and gathering had been completed.[92]

The interpretation of the Commission that the rates charged by independent producers or gatherers to natural gas companies are beyond its jurisdiction has

[90] *Ibid.*, at 800.

[91] 98 *Cong. Rec.* 8809-8810.

[92] It is possible that independent producers with extensive gathering and processing systems might take advantage of this approach of the Court by selling all gas at the wellhead and then making a separate contract to furnish processing and short-line transportation. Thus, they might escape Commission regulation.

resulted in serious inequities. The unregulated field prices may be as much as two to three times the prices allowed for integrated companies. Consequently, many integrated companies have divested themselves of their producing and gathering holdings so that over 90 percent of the gas reserves of the nation are now in the hands of independents. The higher prices pipe-line companies have had to pay to independents are passed on to the consumer because the rates received by the pipe lines are calculated on the higher costs.

From the standpoint of the public interest as well as the welfare of the natural gas industry, it is clearly desirable that greater certainty be introduced into existing regulation of natural gas. Any solution to this legal controversy must take into account the transformation the natural gas industry has undergone since 1935. At that time, the Federal Trade Commission suggested that independent producers were among those needing help from Congress. Attention was called to a high degree of concentration in the control of natural gas pipe lines. Since the natural gas producer, unlike the producers of coal and oil, is dependent upon a pipe line to market his product, he was sometimes at a disadvantage in negotiating for the sale of his gas.[93]

The post-war growth of the industry has brought striking changes. Increasing concentration of control in the production of natural gas, especially in the Southwestern fields, presents the possibility that the independent producers may be among those creating evils.[94] The greatly expanded business of natural gas transportation with a tremendous financial investment is dependent upon the producer to meet its requirements and repay the high capital outlay. Some producers have succeeded in constantly pushing field prices upward—a burden that the consumer ultimately bears.[95] During the hearings on the Kerr Bill in 1950 Senator Kerr admitted that the chief interest of the proponents of the legislation was higher field prices.[96] This is the situation to which President Truman referred when he vetoed the Kerr-Harris amendments to the Natural Gas Act. The President said:

"Unlike the purchaser of coal and oil, purchasers of natural gas cannot easily move from one producer to another in search of lower prices . . . . The pipe-line companies, and in turn the consumers of natural gas, are bound to the producers and gatherers in a given field by the physical location of their pipe lines, which represent large investments of funds, and cannot readily be moved to other fields in search of a better price."[97]

The misgivings expressed by the Federal Power Commission in the Columbian case should be remembered. The Commission recognized that the exemption it extended to the sales of independent producers created a gap in natural gas regulation. At the time the Commission acknowledged that:

"Further experience with the administration of the Natural Gas Act may reveal that

[93] See above. This view was reaffirmed by the Temporary National Economic Committee, *Investigation of Concentration of Economic Power*, Monograph No. 36, 76th Cong., 3rd sess. (1940), and, as recently as 1944, by the Supreme Court in *F.P.C.* v. *Hope Natural Gas Co.*, 320 U.S. 591, at 610.

[94] In 1950, 33 oil companies held in lease or fee five-eighths of the total gas and oil acreage. More than half the acreage was in the hands of 20 companies. In the Hugoton and Panhandle fields three-fifths of the acreage was controlled by 10 companies. 96 *Cong. Rec.* 4563. Nine fields in Louisiana were 100 percent owned by one company. 96 *Cong. Rec.* 3724. In 1947, 69 producers (3 percent of the total) accounted for 70 percent of all sales. At the same time, in the 7 Southwestern states, which at the time contained 88.8 percent of all gas reserves, the first 35 companies accounted for 72 percent of all sales; the first 12 companies accounted for 50 percent of all sales; and Phillips alone accounted for 12 percent of all sales. 96 *Cong. Rec.* 3724.

[95] The average value of natural gas at the well-head rose from 6.5¢ per 1000 cubic feet in 1950 to 7.3¢ in 1951, the sharpest rise in the average value yet recorded during one year. An increase of only 0.3¢ per 1000 cubic feet from 1949 to 1950 increased the total value of marketed production at the well-head by $72,000,000. U. S. Dept. of Interior, Bureau of Mines, *Mineral Industry Surveys*, Mineral Market Report No. MMS 2099, October 7, 1952.

[96] 96 *Cong. Rec.* 4564.

[97] 96 *Cong. Rec.* 5304.

the initial sales of large quantities of natural gas which eventually flow in interstate commerce are by producing or gathering companies which, through affiliation, field agreement, or dominant position in a field, are able to maintain an unreasonable price despite the appearance of competition. Under such circumstances the Commission will decide whether it can assume jurisdiction over arbitrary field prices under the present act or should report the facts to Congress with recommendations for such broadening of the act and provision of additional machinery as may appear necessary to close this gap in effective regulation of the natural gas industry."[98]

[98] 2 F.P.C. 200 (1940), at 208.

Since unregulated field prices are several times higher than comparable costs for integrated companies, there is a strong presumption that they are unreasonable because the latter have met the tests of reasonableness. Therefore, it is imperative that the Federal Power Commission re-examine its experience with the administration of the Natural Gas Act. An objective study of the pricing of natural gas in the field would help Congress to revise the Natural Gas Act on a rational basis—if such amendment is necessary.

British New Towns Today

By WILLIAM O. HART*

"STARTING as the boldest vision of contemporary British town planning, the New Towns program is now a wavering policy in the hands of sceptical administrators . . . ." So wrote Lloyd Rodwin in the November 1953 issue of *Land Economics*. Even if this were a true appraisal at the time, it would not represent the position today. When Mr. Rodwin wrote, the latest published annual reports of the fourteen development corporations related to the year ended March 31, 1952.[1] The most recent reports now available are those for the year ended March 31, 1955. The contrast between the two is marked.

In 1952 the stage of construction had barely started after the lengthy planning period, which had been unduly drawn out by the impact of economic difficulties in which the country found itself in the postwar years. In 1955, building is in full flood and some of the new towns are half-completed. To give an idea of the difference it will be necessary to quote some figures derived from the annual reports of 1952 and 1955. First, in 1952 the total expenditure on capital account by the fourteen development corporations was £27.25 million; or an average of £2 million each, the actual individual maximum being £4.6 million. In 1955 the total had risen to £112 million, or an average of £8 million each with the individual maximum of £18.6 million. Again, in 1952, the gross revenue of all the development corporations totalled £0.5 million, while in 1955 it was £4.1 million. Moreover, in 1955 six of the development corporations were making profits on general revenue account. In other words, the corner has been turned: new towns can no longer be classed merely as expensive social experiments since some of them have already shown their economic soundness.

In the physical field of construction the story is the same. In 1952 the fourteen development corporations had completed 4,586 new dwellings, an average of no more than 327 each with an actual individual maximum of 1,007. By March 31, 1955, the total completed was 33,556, housing over 125,000 people. New factory premises have also kept pace, the total employment having reached the figure of over 20,000.

It would be tedious to go on comparing the figures for the end of March 1952 with what they have become three years later. Enough has been said to make it clear that there would be every reason for a different climate of opinion prevailing among new town administrators than the scepticism which Mr. Rodwin thought he detected among them at the earlier date. Similarly, if the policy was wavering when Mr. Rodwin wrote, it must subsequently have come back onto a firm and straight course, because there is now no present disposition to abandon what have recently been called "Britain's Boom Towns."[2]

There is, however, more to be said than a mere comparison of figures. In 1952, though "scepticism" and "wavering" were too strong words to use in expressing the attitude to new towns of many of those engaged in the movement, it was undoubtedly true that some degree of disappointment, if not disillusionment, existed—and it was a not unhealthy thing

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[1] *The Reports of the Development Corporations* for 1952/53 were not ordered to be printed until December 1953.

[2] *The Economist*, November 20, 1954.

that this should have been so. The New Towns Act was passed by Parliament in 1946—at a time when the post-war enthusiasm for large-scale projects of social betterment was at its height. New towns was a magic conception which captured the imagination. The development corporations seemed to be agencies specially created to cut the red tape of normal government action, and Parliament appeared to have endowed them with limitless powers to carry out their great and exciting tasks. Thus, the second section of the New Towns Act declared that, for the purpose of developing the new town, each development corporation should:

"have power to acquire, hold, manage and dispose of land and other property, to carry out building and other operations, to provide water, electricity, gas, sewerage and other services, to carry on any business or undertaking in or for the purposes of the new town, and generally to do anything necessary or expedient for the purposes of the new town or for purposes incidental thereto."

What more could be wanted?

But the passage quoted did not stand by itself, any more than development corporations stood by themselves. Other provisions of the Act limited the broad, loose words which the casual or enthusiastic reader might alone notice. The State, in the shape of the responsible Minister, must approve proposals for development before the corporation could begin to carry them out; he and the Treasury must be satisfied that the proposals were likely to bring in a financial return to the corporation which was reasonable in all the circumstances when compared with the cost of carrying them out; he was the sole source from which the corporation might borrow the capital moneys which it would need. These provisions of the New Towns Act throw a very different light upon the glamorous picture of the almost omnipotent development corporation. And indeed a moment's reflection must show that picture always to have been unreal: the cause of developing new towns could, no more than any other good cause, be exempt from controls which are characteristic of a democratic country.

So too, in much the same way the conception of the development corporation as a special agency, able to disregard the normal authorities concerned with controlling development, was always equally unreal. It was true that it could be endowed with powers to supply water or to provide main sewerage services which normally were the functions of local authorities. But it could hardly expect to be exempt from the need, falling on all developers, to obtain the reasonable agreement of the local authority to such matters as the specification of the streets or lighting or sewers which it would, in due course, require the local authority to take over and maintain at the public expense. Similarly, the development corporation could hardly contemplate itself providing all public services, especially those involving specialist skills or requiring plant on a scale which could not be economically supported by merely one medium-sized town. Thus, no development corporation would attempt to provide and manage a public educational system, but would naturally look to the local education authority for this service: so too with hospitals. Indeed these conclusions are re-inforced by the fact that development corporations do not have the powers of local taxation by levying rates which local authorities possess, and could hardly face with equanimity the prospect of financing expensive services of this kind out of the profits of their development. Again, gas and electricity supply would normally be uneconomic in small units, and moreover, shortly after the New Towns Act was

passed, were nationalized and made the subjects of State monopolies.

The disillusionment—in the strict sense of removal of an illusion, unreal in its origin—caused by the realization of these circumstances was a healthy lesson soon learned by those engaged in the work of new towns. Unfortunately, it was not apparent to the general public, who are still apt to be surprised when they find that development corporations never had unlimited powers—but then they are often equally surprised to find that developing a new town is not limited to imaginative architecture and daring social experiments but involves a great deal of dreary work on such things as drains and sewers, economics and finance.

Another element in the process of bringing the new town dream down to earth derived from the economic condition of the nation. Immediately before embarking on the new-town policy Britain had been engaged for six years in an all-out war during which she had not only exhausted the vast majority of her overseas assets but had also incurred heavy overseas debts. To live she must import food and raw materials, and to import she must export, a necessity rendered more urgent by her impoverishment in the cause of liberty. A managed economy on a scale and in conditions of postwar instability was a relatively new undertaking, and its control has tended to waver much more than the policy of new town development. Nevertheless, the impact on new towns has inevitably been marked, and has undoubtedly been discouraging. In this, however, new towns have not suffered more than other forms of economic enterprise concerned with purely domestic developments. Their legitimate complaint can be put no higher than that they were made to conform to national policies, which were established to meet the general requirements of the country as a whole and did not take special account of the peculiar needs of new towns. Thus, building was controlled by a licensing system which was operated so as to limit capital investment, for example, in factories to those which would improve the country's export trade. Nor were exceptions made in favor of new towns; even the risk that they might otherwise become dormitory areas was not allowed to justify the erection of other types of factory in them.

Again, the recurrent economic crises carried with them varying shortages of building materials and differing financial implications, all of which made more difficult the already complicated task of developing new towns. In all this, however, new towns, though they might complain of the difficulties into which they were forced, were not singled out for worse treatment than other forms of enterprise.

In these circumstances the annual reports of development corporations contained a string of complaints. At their face value these might appear to be evidence of a morale lowered under the impact of events. But it must be remembered that development corporations are not elected bodies resting upon the solid foundation of popular suffrage: their members are appointed by the Minister and are responsible to him. Their one opportunity of addressing a national audience is in their annual reports, which tend in consequence to be used by them to draw attention to matters on which they hope to obtain redress from inconveniences which affect them.

All this is not to say that there were, and are, no legitimate grounds of complaint. Granted, for instance, that the machinery of democratic government must impose some control on the expenditure of public money or the exercise of powers affecting the property of indi-

viduals, there may yet be room for a wide variation in the way in which that control is exercised. Without going into details it may be said that the control over development corporations has been exercised in too meticulous a manner, tending to examine each individual scheme or project in isolation, rather than encouraging a sense of responsibility by being limited to broad considerations. Such a tendency was of course inherent in the financial clauses of the New Towns Act: the development corporations could obtain the capital they needed only by way of loan from the Minister, who was expressly required to satisfy himself and the Treasury of the financial soundness of their projects. Since he was thus made politically responsible for all expenditure by development corporations, the Minister was inevitably concerned with the details of each proposal. In much the same way local authorities have often been disposed to exercise their control in a meticulous fashion: for instance, they might be required to take over and maintain works carried out by development corporations and not unnaturally they have tended to insist that they should not be expected to take over any risks. Without pretending that the exercise of the various forms of control has been put on an entirely satisfactory footing, it may be said that, in general, development corporations have on the one hand ensured that the process was not carried too far, and on the other hand have organized their work so as to satisfy as a matter of normal routine the necessary control procedures.

Having made these general and introductory remarks it may be of interest to refer to some of the other matters which Mr. Rodwin dealt with in his article of 1953 and to consider how with the lapse of time they now stand.

Mr. Rodwin pointed out the difficulties which appeared to exist in regard to initial development costs. Heavy capital expenditure on the provision of services must be incurred a long time in advance of the final stages of development, before which they may not be fully employed. One of the reasons for the decision to employ government-sponsored public corporations to develop the new towns was the need to avoid the results of undercapitalization and, with the increased allotment of Exchequer funds for the purpose,[3] this has been successfully overcome. But, as Mr. Rodwin asked, how are the resulting financial burdens to be borne, especially where local authorities may be concerned? This question in turn breaks down into two others: first, who shall provide the capital for the new or enlarged services at the time when the investment must be made; and secondly, who will ultimately carry the burden? This second question has inevitably loomed over all negotiations between development corporations and local authorities and, because it has not been capable of a definitive answer, it has tended to distract attention from the more profitable task of finding a practical answer to the first question.

These uncertainties have undoubtedly contributed largely to prevent a full provision being made at the most appropriate time of some facilities, for example, public parks and playing-fields. They have not, however, hindered unduly the provision of the basic essentials for the development of any new town, for example, water supply, main sewerage, schools.

In the first two cases special statutory rules exist. They enable a development

[3] The New Towns Act, 1946, provided for a total sum of £50 million. This was increased by a series of Acts of Parliament, of which the latest is the New Towns Act, 1955, to the present maximum of £250 million. This will be increased further as may be necessary.

corporation itself to be empowered to provide water supply or main sewerage if the local authority is unwilling or unable to do so. Where this is done the development corporation must be enabled to draw upon the sources of revenue available for supporting such services where they are provided normally by a local authority. Accordingly, where a development corporation is empowered to become a water undertaker, it may make the usual charges which any other water undertaker may make on its customers. In the case of main sewerage the development corporation cannot itself directly levy rates on the residents in the area served as may a local authority but is permitted to claim a contribution from the local authority the amount of which, in default of agreement, is to be settled by the Minister of Housing and Local Government.[4]

There is, in addition, a more general provision in the New Towns Act not limited in its application to any particular service.[5] Under it a development corporation may, with the consent of the Minister, make financial contributions to local authorities to assist them in the provision of public services.

Water undertakings are, in part at least, trading services and the tendency has been for local authorities already operating them to agree to expand them in return for agreed financial contributions by development corporations. On the other hand, main sewerage has not the same economic attractions and local authorities have tended to fight shy of assuming responsibility for the large capital expenditure involved in meeting the needs of new towns in this respect. Hence, the position has been reversed, the development corporations incurring the loan debt and looking to the local authorities for contributions which, so far as development has gone, have not amounted to more than a small fraction of the annual loan charges.

Education is a service the local administration of which is supported by heavy grants from the central government and which, in consequence, is under tight central control. No special difficulties have therefore arisen once the local education authorities and the Ministry of Education realized the pace at which development was moving. Classified roads have been a cause of difficulty, largely because the Ministry of Transport, which would normally provide generous grants for their provision, has itself been kept insufficiently supplied with money to enable it to meet even the obligations it felt it should carry out to keep the existing main road system of the country in reasonable condition. As a result it has been reluctant to assist in building new classified roads and what has been done in this way in new towns has had to be financed wholly or in part by the development corporations.

It would be a valid criticism of the financial relations between development corporations and local authorities that not enough use has been made of the power of development corporations to make financial contributions. By their more generous use it would have been possible for new or extended services to have been provided by local authorities when first needed, even though this might have been before the towns had grown sufficiently to make their provision wholly economic. But local authorities in general were reluctant to assume responsibilities which they could not hope later to discard merely on the faith of transitional financial aid: the question of how the ultimate financial burden should be borne bedevilled the problem of immediate financing of the services when first

[4] New Towns Act, 1946, Section 9.
[5] Section 11.

instituted. An early attempt at a general settlement of the principles on which development corporations should assist in financing new and expanded services broke down for these reasons.

This result was also in part inspired by the different financial structures of local authorities and development corporations. Local authorities are organized primarily on an annual cash basis to provide services which, so far as their cost in any year is not met by government grants or other revenues, will be financed by an annual rate locally levied. Where capital expenditure is necessary the amount is borrowed on terms requiring amortization over a fixed period, so that there is a tendency to regard the transaction as primarily the creation of a temporary debt involving the payment of annual loan charges over a number of years. Nor in general is there any power to borrow except for purchase of property or carrying out of work: there can be no borrowing to meet interest charges before an asset has fructified.

The financial basis on which development corporations rest is different from that of local authorities. Development corporations have a commercial financial structure. Their object is the creation of capital assets, if not of only one capital asset—a town. They must be able to borrow capital, not only for the purchase of property and the carrying out of works, but also for the payment of interest until their assets have fructified. They have no powers of rating and their final valuation balance sheets are of far more importance than their annual revenue accounts. Though the power for development corporations to make financial contributions to local authorities ought to be the bridge by which these two different financial structures are linked, the habits of mind engendered by their systems of finance have made it difficult for local authorities to make as full use of the possibilities of financial contributions as might have been expected.

The financial success or failure of a development corporation cannot really be known until its task is complete and the value of the asset it has created can be set against the actual capital expenditure and the accumulated interim revenue deficiencies incurred. This has encouraged some pessimism on the part of local authorities about the effect on them of new-town development. The County of Hertfordshire, for example, has no fewer than four new towns within its boundaries. At the inception of the new-town program the County Treasurer made an estimate of the probable financial effect of this phenomenal development and reached the conclusion that it was likely to mean that a very heavy burden would fall upon the county. By March 1954 the actual position was that the County Council had enjoyed a net surplus of £13,500 from the additional income derived from the development of new towns after allowing for the additional expenditure falling upon it in consequence. Of course, this result was not wholly comparable with the estimates; it was, for instance, in part attributable to delay in carrying out some projects included in the original estimates and is not, therefore, conclusive; but it illustrates that there may have been undue pessimism in the assessments of local authorities about the results they might expect from development of new towns in their areas.

Local authorities were interested in this matter for another reason. The original idea was that, when a new town was complete, the development corporation should be wound up and its assets should be transferred to the local authority of its area. The local authorities

were thus the heirs presumptive of the development corporations—a fact which may have tended to induce a reluctance to shoulder financial responsibilities in the belief that they would have to be met by the development corporations and their benefits would be inherited automatically. If so, this may prove to be a disastrous over-reaching. For now the fundamental assumption of local authorities' right of succession is beginning to be questioned on a variety of grounds, an important one being that the overwhelming share of the risk capital invested in the new towns has been provided by the Exchequer while the local authorities have ventured little to justify a claim to what will clearly be most valuable properties.

Enough has been said about a subject the final answer to which cannot yet be given. It is sufficient to say that so far no undue burden seems to have fallen on any local authority concerned with a new town, nor have undue burdens fallen on the development corporations' tenants in the form of excessively high rents.

House rents in new towns have been high by comparison with other house rents. But the comparison has been with local authority rents and rents of dwellings controlled under the Rent Restriction Acts, both of which have been unduly depressed below the proper economic level. New town rents have reflected the postwar economic level, distorted only to the extent of the statutory housing subsidies payable for all local authority and development corporation dwellings built for letting. However, new town rents, once fixed, could not (when Mr. Rodwin wrote) be raised, whatever change of circumstances might occur. Hence the rents of the earlier houses, which were fixed by reference to the lower level of costs obtaining when development corporations began house building, could not be raised to come into line with the higher levels established more recently to meet increased building costs. However, early in 1955 development corporations were freed from the Rent Restriction Acts and accorded the same freedom to vary the rents of their dwellings as local authorities always possessed.[6]

Though, as has been said, new town rents are high, they are now by no means relatively so much higher than the corresponding local authorities' rents as they were originally. Local authority rents have been creeping up and quite recently announced changes of policy regarding housing subsidies,[7] coupled with increases in the rate of interest charged on loans including housing loans,[8] should narrow the margin between local authority and new-town rents to a marked extent. If the Rent Restriction Acts are also to be amended as already forecast, new town rents should soon fall into place in a national structure of economic rents.

Whatever the future may thus see, it can be said that the development of the new towns has not been retarded because of high rents. The Scottish new towns, it is true, because of the peculiar incidence of owners' rates and the general low level of rents in Scotland, have had to charge some uneconomic house rents, and special concessions have been made in the mining town of Peterlee. Elsewhere the earlier fears of the development corporations have proved to be unnecessary. Rents in new towns, though

[6] The Housing Repairs and Rents Act, 1954, Section 33.

[7] Announced in the House of Commons on October 27, 1955. New housing subsidies from the Exchequer will be reduced and finally abolished, except for slum clearance and "overspill" building, including building by new-town development corporations. Local authorities will also be relieved of the compulsory obligation to make a contribution from the rates.

[8] There have been several variations in the rate of interest charged to local authorities—and development corporations—and the current rate is 5 percent.

they may have looked high when compared with other house rents, have often been shown to compare not unfavorably with tenants' former weekly payments for furnished or unfurnished rooms in London added to their travelling expenses between home and work. In any case, the record of rent arrears in the new towns is a remarkably good one.

New towns are not, however, to be judged solely by financial tests. They are being developed as a means of improving the living and working conditions of people, and it is to these beneficiaries of their establishment that attention must now be paid.

In the early days of their development some of the new towns found difficulty in attracting the industry which was essential to them if they were not to become mere dormitory settlements. This difficulty arose partly from the reluctance of industrialists to experiment by transferring their businesses to what were still rural areas lacking nearly all the amenities and facilities of towns and subject to all the inconveniences which large-scale civil engineering and building activities can create. In addition, the Board of Trade, the government department responsible for administering the national policy on location of industry, did not encourage—if indeed it did not positively discourage—industrialists who might think of moving to new towns. Happily both conditions have passed and the flow of industry to the new towns is not now causing concern so that fears lest new towns should fail in becoming "self-contained," as providing employment for their inhabitants, have now passed.

Moreover, the new inhabitants are settling down remarkably well. The number who have left to return to their former home is negligible,[9] and fewer still have become commuters so as to take up once more their former employment.

This is largely the result of the Industrial Selection Scheme which controls the the movement from London. Under this Scheme the development corporations' house tenants are nominated by the industrial firms moving to the new town from among their existing employees willing to move with them and from new employees chosen by them from classified lists of Londoners who have registered as wishing to move to new towns.[10] In consequence, the qualifications for tenancy of a "London" new town house are are two: residence in London and a job with a firm transferring to the new town. Hence new town tenants start with employment in the new town. They are also all in some sense volunteers. In consequence, as might be expected, they are predominantly young married people who are attracted to the new towns largely because of their desire to find better living conditions for their children. They come determined to strike their roots into the place and they are creating vigorous, youthful communities.

But their very youth creates problems. The exceptionally high proportion of children is throwing a heavy strain on the local education authorities, coinciding, as it does, with the national "bulge" in the child population resulting from the high birth rate after the war.

It will be some considerable time before the age structure of these young communities approximates to that of the nation. After immigration ceases natural increase of population will ensure that the new towns will continue to grow at a significant rate for a generation. All these, and similar, problems arising

[9] At December 31, 1954, out of a total of 4,270 families who had then moved into Crawley, 154 had left the town. Their reasons included change of employment, emigration, health and domestic reasons. Only 38 had moved because they could not assimilate their conditions. *Reports of the Development Corporations*, 1955, p. 139.

[10] *Ministry of Housing and Local Government Circular 29-53* of May 6, 1953.

from the nature of the new populations present the development corporations with a dilemma: are they to build to suit the immediate needs of their present tenants, or can they take into account the needs which will arise years hence when the population has reached normality and stability? To some extent compromise is possible; for example, a proportion of dwellings designed for old persons happily can be filled by the relatives of younger tenants, thus helping to reduce the pressure on the schools and at the same time going some way to cater for demands which will materialize later as the original immigrants grow older. To some extent also future needs can be met by leaving small areas undeveloped at the present day. But the dilemma still remains unsolved, to some extent because the possible requirements of a generation hence cannot now be foretold.

So far as the present is concerned, though, as Mr. Rodwin noted, austerity has ruled in the provision of community buildings and facilities, sufficient has been provided to ensure that the newcomers have at least somewhere to meet together. In the early days of each neighbourhood this meeting place may be temporary and even somewhat primitive, but it does ensure that the first steps towards establishing a community are possible. Such facilities are heavily used for all sorts of objects, not only secular but also religious, and they have proved very valuable in developing the social life of the new settlement. On the religious side the churches have rightly recognized that men, and not buildings, must come first. They therefore start early with their ministers, who can well make use of the common meeting place in their early days. But the financial difficulties, which seemed likely to prevent new churches being built, have been largely overcome by the use of central denominational funds.

On the physical side of their work, development corporations have hitherto concentrated their energies mainly on the provision of basic services, of housing and of factories. They are only now starting to develop their central shopping areas. In the field of housing this has meant that there has been a heavy concentration on building homes for factory workers with the danger, as was pointed out by Mr. Rodwin, that their character as one-class communities might become established and be difficult to change.

The mere absence of many larger houses is not, however, conclusive. Patterns of living and habits have changed profoundly since before the war, and the pressure of taxation has reduced the housing demands of the professional and managerial classes to something much more modest in size. Though the external appearance of dwellings may not seem to confirm the position by traditional tests, in fact there has already been a material intake of young professional men and junior executives.

Another factor that must be remembered is that the professional and business men cannot establish themselves economically in a town until it has grown sufficiently in population to provide them with an adequate clientele. Rapidly growing towns have always seen a large inflow of industrial workers first, but have not necessarily been doomed thereby to be perpetually stamped with a one-class character. There is no proof yet that Britain's new towns will be so stamped.

It remains to refer to the major objectives which the policy of new towns sought to achieve. Primarily, new towns were established as part of the wider policy of dispersal—mainly decentraliza-

tion from London. How far is decentralization working?

The Greater London Plan of 1943 was the basis for this. The Plan as finally approved envisaged an ultimate "overspill" of some one-and-a-quarter-million people together with corresponding industry. The eight new towns established around London were to accommodate some 330,000 people and, after purely short-term housing estates in the immediate postwar period, should give the first relief needed to permit the redevelopment of London to begin. Thereafter the larger proportion of the overspill which would be "decanted" more slowly, would be housed in "expanded towns," that is, small towns within a much wider area around London which could be enlarged in varying degrees. Just as the New Towns Act of 1946 made provision for the new towns, so the Town Development Act of 1952 made provision for the expanded towns, which are to be enlarged under agreements between their local authorities and the local authorities of the "exporting areas," and which may be assisted by government grants.

The eight new towns of the Greater London Plan are all under way, as are six more new towns in other parts of Britain. But no more new towns have been designated since 1950. Meanwhile, the London local authorities have been seeking to start the expanded towns program, though so far without a great deal of success. In the rest of the country the policy of dispersal has not got far. Manchester and Glasgow have pressed for new towns to meet their needs, but only recently has it been agreed that a new town shall be designated to relieve Glasgow, though with peculiar arrangements about financial contributions by Glasgow. Elsewhere there is yet little practical to show in implementing the general dispersal policy.

All this does not, however, mean that new towns are a failure nor does it mean that there are to be no more of them. A change of government since the original 14 new towns were designated has undoubtedly been a material factor: the previous government has been criticized for starting too many new towns instead of concentrating upon a few which could have been pressed to earlier completion and which would have brought to light unforeseen problems. Another factor has been the designation procedure laid down in the New Towns Act. This has been criticized as autocratic and unfair, and is out of harmony with current thought.

So far as London is concerned the main burden of dispersal has so far fallen upon the new, rather than the expanded towns, but the effects on the exporting areas are broadly the same. From this point-of-view dispersal is not working as well as might have been hoped. The proof of success would be a reduction in the population of London and in the employment available there proportionate to the number of people housed and the number of jobs established in the new and expanded towns. So far there is no sign that this has in fact happened.

Short of most drastic inroads upon property ownership it would be impossible to prevent a dwelling vacated by a family moved out of London from being occupied by a family moving into London from elsewhere and, even if it were possible, it would be administratively most difficult to operate such a control. The only practical check which could be used is one over the employment available in the area—a city's size must normally depend upon the number of people who can find gainful employment in it. This has been the assumption on which the dispersal policy has rested and legislation has been passed by Parlia-

ment[11] requiring a certificate to be obtained from the Board of Trade before a factory building exceeding 5,000 square feet in area can be erected. The policy, in accordance with which this control is exercised, disapproves any increase in industrial employment in the London area. Apart from the small workshops and extensions under 5,000 square feet and the inevitable exception where some extension to existing plants must be accepted, there is a large loophole in that there is no control over the establishment of an industrial business in an existing industrial building. Thus when a manufacturing company moves from London to a new or expanded town there is in general no prohibition against its former premises being used by a newly established industrial concern or by an existing one moving into London from elsewhere. In theory, therefore, it would be possible for a large number of industrial companies to be moved out of London, only to be replaced by other companies moving into London. The total pool of industrial employment might thus remain constant, or even increase.

Of course in practice this does not always happen: the sites from which some industries move are required for other purposes and are sooner or later acquired by local authorities or government departments to be put to the new uses. But there is no guarantee that this will be so and the effect on the total amount of employment offering in London has so far been imperceptible. The only solution to this problem seems to be purchase of all vacated factory sites by the London local authorities, either for immediate or ultimate change of use or to permit relocation of other industries already in London which must be moved to release their sites in turn for other planned uses. Though it may be that the money invested in such purchases would, in the long run, be recovered, the sum involved would be a very large one, the interest charges would be proportionately large, and no London local authority has so far felt able to face the consequences of adopting such a course. Quite recently, however, the government has announced that it is willing to make grants of half the cost of such purchases, and it may be that the local authorities will review their policy in the light of this financial help.

Whatever the results may be, it is becoming apparent that manufacturing industry is not the only, nor necessarily the most significant, source of employment in London. The emphasis placed on industrial employment as the key to size in the Greater London Plan derived from the Barlow Commission Report.[12] The Commission was impressed by the increase in the population of Greater London between 1919 and 1939. In that period of twenty years, the increase amounted to one-and-a-half million of which no less than one-and-a-quarter million represented immigration into the area. This coincided largely with a period of economic depression and unemployment, during which the establishment of new light industries in the south of England, and particularly in the Greater London Area, was a marked feature. Hence the conclusion was not unnaturally drawn that, as the new employment offering in manufacturing industry had been the cause of the increase in the size of London, control of such employment would control the future size of the Metropolis.

More recently, however, it has become apparent that office employment is a most material factor in the size of

[11] Town and Country Planning Act, 1947, Section 14.

[12] *Report of the Royal Commission on the Distribution of the Industrial Population*, Cmd. 6153/1940.

London, and that the location of larger office buildings in the center is an item making for worse congestion in many ways than the inter-war building of light factories on the outskirts. No powers of control over office employment exist save the general planning powers of zoning the use of land. In this connection it is interesting to note that the Ministry of Housing and Local Government recently curtailed business zonings in the County of London Development Plan on the ground that too much provision was being made for offices.

Until these problems of preventing the "exporting" area from again increasing are solved, some may say that the new and expanding towns are failing to achieve their object. This, however, would not be wholly true: their functions are twofold. On the one hand, they are a means of providing for overspill from the conurbation: on the other hand, they have their own end of providing healthy, convenient and efficient conditions for modern living and working. However the conurbation's problems may remain unsettled, there can be no doubt that the development corporations have proved successful agencies for large-scale development and that the new towns are fulfilling their own primary functions and creating vigorous communities, well-equipped to meet the conditions of the modern age.

Mechanics of the Urban Economic Base: The Base Concept and the Planning Process†

By RICHARD B. ANDREWS*

IN all preceding articles of this series it has been assumed that the significance of the urban economic base concept lay in its efficacy, immediate or potential, in the city planning process rather than in its academic aptness as a means of classifying localized economic activity.[1] Earlier articles showed in a general way the planning significance of such technical factors as base identification and measurement. Discussion of the base ratios, particularly their dynamic characteristics, brought the relation of the base concept and planning into even stronger focus.

The present article will center its entire argument on the relation of the base to planning. Specifically, it will discuss by way of introduction the association of economic planning with the city planning process, an area of thought in which there exists considerable differences of opinion as to degree and kind of planner responsibility and action. An examination of current economic control techniques will be made with the objective of appraising the degree to which they are usable by formal and informal planning groups as well as the degree to which they are likely to attain meaningful and desirable results. Finally, the paper will turn to what might be called urban economic planning "frontiers." Here will be discussed those proposals for planning action which appear infrequently or not at all in formal planning reports but which may well hold great hopes for further rationalization of our urban economies.

City Planning and Urban Economic Planning

The general objective of city planning might be described as the process of making the city a better place in which to live, recreate, and work. Broad as this aim and consequent mandate is, its execution by the typical city planner is confined by the restrictions of budget, time, the realities of politics, and his own vision to the familiar, prescribed details of physical planning. The inadequacy of the physical planning approach as the only operating approach has been stressed by both planners and critics of planning for the past thirty years. It has been only within the last twenty years, following the lead of Hoyt and the FHA in housing market analysis, that practical applications of general urban economic data have been successfully made. Currently, community economic data, particularly as they refer to the base, are employed by the planner more and more as a check on the appropriateness of specific physical plans.

It appears, in fact, that over the years there have evolved two approaches to or interpretations of the role of general urban economic data in the city planning process. In one view, apparently the dominant one, general economic data are employed as mentioned in the preceding paragraph to verify the soundness of a specific physical plan or the community master plan. This procedure rests on the idea that the urban economic base has a

† This article is the twelfth and last of the series dealing with the theoretical and technical aspects of the urban economic base concept.

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[1] The economic base of a community is composed of those activities which export goods, services, and capital to individuals or firms whose source of payment is outside the urban economic area under analysis. Service activities which operate as an economic complement to the base in a community do not export their goods, services, or capital but sell them to local firms and the local population.

direct long-run influence over the quantitative total and social qualitative make-up of the community population. The size and character of population in turn determine the detailed needs and demands for a special combination of land uses, specifically, housing, retail, manufacturing (service), recreational, school, transport, utilities, street use and so forth. The present status and anticipated trends of the urban economy, therefore, are the basis for forming and ultimately changing the detail of the community master plan. It is also here assumed that the desires of the population relative to the kind of community they wish planned have practical financial limitations set up by the nature of the local economy.

The second view of the use of urban economic data is different from the first largely in the fact that, whereas in the first instance the planner plays a relatively passive role—allowing his plans and those of the community to be guided by the present and estimated future of the local economic structure, he and the community in the alternative approach take an active role in fashioning the economy in order that it will more nearly accomplish the ends of living, recreating, and working which all desire. In many of those urban areas where conscious manipulation of the economy has been attempted, the economy rather than the combined planning objectives of the community have been considered the important end. This is, of course, a false emphasis which can lead to economic distortions and general frustrations of community growth.

As can readily be seen, these two views are not mutually exclusive and in all propriety should work together if a community is to gain the full benefit of its planning potential. However, there exists a substantial question concerning the role of the city planner as an active agent in manipulating his local economy.

In the opinion of this writer the task of the city planner, relative to the economy of his area, assumes different forms nearly all of which can be subsumed under the two general interpretations described in the foregoing paragraphs: (1) The planner has the duty of *understanding* his economy in order that he can make intelligent plans for the community which is in large part the social and physical outgrowth of this economy. Understanding includes not only the *status quo* of the urban economy but also its characteristics in movement, in short its dynamic character. (2) Understanding enables the performance of another obligation, that of *estimating* the secular trend, quantitative and qualitative, of the local economy. (3) In a broad sense the city planner also has the obligation of *protection*. The protective function can be thought of in terms of the protection of livelihood of the population,; i.e., jobs, businesses, and local realty investments. Investments can be considered public as well as private, i.e; the tremendous investment in streets, parks, and public buildings. The protective function includes as well the concept of preservation from deterioration or decline of the economic competitive position of the community. It also embraces the idea of protection from the more severe economic shocks that result from cyclical variations in wages, profits, and rents. (4) An extension of the obligation of protection is undoubtedly that of *promotion* in the specialized rather than popular sense. Here is envisioned planning that results in fuller employment, a greater variety of employment opportunities, higher wage levels and investment returns.

The actual participation of the planner in promotion and some aspects of protection is open to question. One of the

better statements of the case appears in the Cincinnati study. An excerpt of the point of view expressed follows:

"Public action is limited in scope. As far as physical developments are concerned, local governments can gear their programs for highways and other services such as water and sewerage in a manner calculated to aid best the future development of the area. Local governments also can, through their planning and zoning powers, where these exist, lay out the general patterns most suitable to sound future growth in a physical sense.

"The stimulus for most economic development and its guidance in a balanced, systematic manner, however, must come from the leadership of private individuals.[2]

In this statement there is evident the traditional emphasis on physical aspects of planning insofar as public action is concerned. Economic corrective action is assigned to the sphere of private enterprise and citizen groups. However, it is of greatest importance to note that the Cincinnati economic study is one segment of the metropolitan master plan. Therefore one might say that the document *is* the economic master plan. Consequently we see in this study something rather unique in planning, a completely sketched picture of the economy rather than a set of miscellaneous recommendations which characterize so many planning reports. Apparently, therefore, it is the viewpoint of this planning group that detailed economic planning is the business of the city planner but that its execution should be divorced from local government and should not be progressive, closely controlled planning as is true of other elements of the master plan.

This separation of powers is, of course, consistent with the political and economic philosophy of many nations. However, from a technical point of view such a situation is known to be inconsistent and wasteful. Specifically, it is inconsistent to expect from a city planner plans which in the long-range view are intelligent and effective when he has no control over the principal determinant of the conditions for which the plans were made. In short, lacking power of guidance over economic plans he is at the complete mercy of capriciously controlled or uncontrolled economic forces which in their dynamic aspects may negate many of his proposals and cause gigantic social and economic wastes.[3]

There is no doubt that the citizen group is becoming an indispensable part of the planning process as city planning in terms of scope and complexity becomes a more awesome thing. It is the author's opinion, however, that citizen groups have limited competence in the fields they attack even in those cases where they retain a permanent staff of professional planners and administrators. The citizen group should concentrate as it does in Chicago and many other large cities on the special problems of a restricted area or on a restricted phase of the city's economic development. This means that the city planner has the job of stating the problems and their relationships and then coordinating the efforts of all local citizen groups and government departments to the ends that appear to maximize the community's welfare.

In those cases where the citizen group assumes the principal responsibility for economic planning several significant objections or difficulties arise. It may be that the local city planner has presented the community with the facts necessary for economic planning and may even have recommended the outlines of a

[2] Cincinnati City Planning Commission, *Economy of the Area* (Cincinnati, Ohio: 1946), p. 73.

[3] It is worthy of mention to echo a belief of Dennis O'Harrow that physical and even economic planning may be to little avail without more adequate planning of our urban political machinery from city executive and council through the jurisdictional jungle that now governs most metropolitan areas.

plan. However, it is likely that a citizen group, depending on its composition, may only pick and choose among the facts and proposals. Such eclecticism may be the result of ignorance of the interrelation of the net of facts and the resultant proposals or it may be in turn the outcome of varying degrees of disagreement with the ideas of the city planner. Such disagreement is proper in a democratic society. However, if the unity and effectiveness of complex economic plans are to be maintained, disagreements must be aired before public commissions and councils who may better appreciate the implications of omissions and changes.

Other objections to dominance of urban economic planning by citizen groups lie in more familiar directions. Continuity of membership, leadership, and financing appear to be more precarious with these groups than with public commissions and committees. Significant breaks in the prosecution of an urban economic plan are likely to have more serious repercussions than those which occur in connection with other varieties of plans. One of the commonest flaws in the approach of the citizen group is the tendency to consider economic improvement of the community in terms of more manufacturing plants. As a matter of fact, industrialization of this variety may be inappropriate or actually injurious to the community. It is likely, in addition, that concentration on expansion of the manufacturing function which is here assumed to be part of the base will lead to the neglect of a careful development of the service aspects of the economy. It cannot be emphasized too often that service activities are of signal importance to the successful operation of the base. Although service activity from a quantitative point of view will tend to expand automatically as the base grows, some of its qualitative characteristics may need considerable guidance if they are to complement the base in a proper manner. Over-concentration on the manufacturing aspects of community economic planning is in part an outgrowth of the fact that businessman-representation on such committees is heavy and usually dominant. Economic planning should not be so concentrated in terms of the source of its guidance. The biases in even the public planning field are bad enough without placing the key planning area, *economic*, in the hands of a group-type that usually has relatively restricted interests toward the community at large.[4] It cannot be gainsaid that non-governmental groups have in specific communities been very effective in economic planning from time to time. However, the proper work of these groups is one of criticism and promotion of and assistance to the city planning commission and the plans of its technical staff.

Current Types of Urban Economic Planning and Adjustment

The objective of the present section of the discussion will be to make a brief review of the most familiar urban economic planning problems and their solutions or approaches as currently suggested by professional planners and as practiced for the most part by citizen groups. In the course of this description an analysis will be made of the ways in which the problems are stated and proposed solu-

[4] A citizen group which appears to overcome the last two specific objections is the Committee of 100 of South Bend and Mishawaka, Indiana. The efforts of this committee are directed at industrial-economic planning and development. This organization is composed of the leading business and professional men of the area with representation from education, local government, and labor. Although its primary objective is the location and expansion of industry in the area it also aims at a better rounding of community life. For more detailed comment see: Robert N. Gold, *Manufacturing Structure and Pattern of the South Bend-Mishawaka Area* (Chicago: University of Chicago Press, 1954), pp. 215-218.

tions propounded in terms of their long-run validity for community welfare. This suggests, of course, an examination of the flaws and misuses of the ideas involved as well as their necessary interrelations. In more precise terms the questions to be covered will include those relating to the scale of economic activity within an urban area, the stability of that activity with emphasis on diversity and seasonality, and to more detailed problems such as the proportion of marginal firms, the linkage potential of the area, and the like. Throughout the relation of economic proposals to the base and service elements, their proper functioning and characteristics—when in the process of induced or automatic change—will be made clear.

Scale. The commonest variety of urban economic planning appears to be that which is concerned with increasing the scale of activity, more precisely the total volume of employment and total payroll within a community. The desirability of this objective seems obvious to all, particularly the traditional man in the street. Simplicity of the idea makes it seductive and hence may obscure its inadequacies in meeting the economic planning problems of a particular local situation. Service elements of the economy are sure to be strongly vocal in pushing broad programs of this kind. More local economic activity, particularly the large-scale additions that are usually promoted in connection with the base, will result in a growth of the volume of local retail sales and hence service profits. On a firm basis the eventual arrival of competitive service firms may reduce the early bonanza but a satisfactory net advance for the older firms is likely to remain. There is, moreover, a community-wide advantage from a property tax point of view. When, particularly, a new industrial firm of any great size is added to a small urban community, taxes may be lightened since industry pays an excess of taxes over cost of public services rendered. This assumes, of course, that tax abatement was not used as a device to get the new firm or firms into the community. In support of this general type of economic planning it can be said that employment and aggregate payroll increases are good for any urban economy regardless of who promotes them. There is no contradicting the fact that, up to a point, city economic and population growth is to be sought because of the community and business production efficiencies that emerge from increase in scale alone. Increase in scale may actually contribute to stability if it results in a larger number of firms as it is rather likely to do. Greater scale can also mean the development of industrial linkage potentials which may trigger a rather automatic cumulative growth. There is, finally, an apparent tendency for per capita income to rise as scale increases.

There are, on the other hand, a number of criticisms to be made of this shotgun approach to economic planning. To repeat an earlier argument, this is the type of program which is customarily in the hands of the amateur citizen promotion group. This fact may, in part, explain the other defects of the action plan.

Perhaps the outstanding fault of planning solely for scale is that the thinking involved is almost entirely on a quantitative rather than a qualitative basis. In urban economic planning the qualitative emphasis is almost a *sine qua non.*

Concentration on manufacturing in the promotion program is most likely to appear when greater scale is the objective. Community economic and population growth seem to be inseparably linked in the popular mind with more

manufacturing which appears to be the only common meaning for "industrial activity." Overemphasis on manufacturing or possibly some other single variety of activity may stimulate conditions which lead either to instability or to aggravation of instability that was already present in the local economy.

In addition, there is the very real chance that the quantitative planning approach will lead to ultimate inefficiencies of scale as a point of diminishing returns is approached. The inertia of cumulative quantitative increase is certain to carry beyond the point of optimum efficiency because the entire program behind such increase is more likely to be promoted than managed.

Finally, from a broader point of view, it is evident that in this frame of reference little attention is customarily given to the question of integrating the quantitative additions to industrial activity with either the long-term needs of the community from a land use point of view or with the more immediate popular views concerning the kind of community ultimately desired.

While non-integrated quantitative expansion of B is usually explicit in the "scale" approach, there do occur special situations in which a portion of B in a particular local economic framework may be under-expanded in terms of its immediate potential. Where by careful analysis or obvious conditions this situation is recognized, adjustment is usually appropriate. An example of this type of problem is to be found in Albuquerque, New Mexico. This city which is at the heart of a major national tourist area has only four hotels. None of these is a resort hotel and all are located in the business district. There are, in fact, no resort hotels to be found in the vicinity outside the city.[5] Here, obviously, is a poorly managed portion of what is essentially potential economic base activity. While this is a rather patent case there may be others which should give the analyst and policy-maker pause. Should, for example, a deficient portion of the base be earmarked for expansion if it is part of a nationally declining industry, an industry undergoing a geographical shift away from the area, or one which even with good management has been, locally, a marginal operation?

This last series of questions raises a query concerning the character of urban economic analysis content as well as corrective policy. More intensive attention must apparently be given in urban economic survey work to the position of the various local base activities in relation to the regional and national trends of each activity from an economic, technological, and geographic point of view. While the objective of such analysis, where it has been conducted, has been mainly that of providing raw material for population, income, and land use forecasting, it should be used increasingly with the objective of local economic adjustment. If certain elements of the economic base structure are in regional or national decline, if there is a significant volume of marginal operators, if there are many plants with poor employment experience records from the standpoint of strikes, wages, and working conditions, if many firms in the base are young with untested products and policies then, if one or all of these conditions prevail, careful and intensive corrective planning is imperative.

The quantitative scale approach to planning of the base is closely associated with another line of local economic

[5] Federal Reserve Bank of Kansas City and Bureau of Business Research, University of New Mexico, *The Economy of Albuquerque, New Mexico* (Albuquerque, New Mexico: 1949), pp. 56-57.

analysis and development, that of the optimum expansion of S in both the goods and personal service lines. Here is contemplated both a quantitative and qualitative analysis which would reveal those activities of S which but incompletely supply local demand thus requiring importation of the deficiency. The principal objectives of expanding S on an independent basis along these lines is to increase local consumer amenities and conveniences and community self-sufficiency.[6] While there is little doubt that consumer and some producer convenience would in many instances be augmented by this measure, there is a question concerning the whole concept of self-sufficiency and the reduction of import dollar expenditures. Whereas most personal service activities should in principle be able to care for typically local needs there is also no doubt that price and quality may be to the advantage of the consumer when the item is imported. In short, the locational advantages of specialization should perhaps be recognized rather than resisted for certain portions of what might otherwise be S activity. This counter-view is, of course, particularly forceful where the community in question is small and under the regional dominance of a large metropolitan center. The larger center may, in fact, be so close in terms of contact or delivery time that even the aforementioned convenience factor of purely local purchase would be largely negated. Finally, there arises a question as to whether the deficiency in S represents a sufficient volume and qualitative concentration of business to warrant either a new firm (or firms) or profitable additions to plant by existing operations.

Stability. With the concept of urban economic stability a transition is made from quantitative programs of scale to an almost purely qualitative approach. The meaning of economic stability as it applies to urban public planning policy refers for the most part to the elimination or reduction of cyclical variations in the economic activity of a community. These variations of the cycle, in turn, involve seasonal and business cycles of the short-span variety. In the opinion of many economists the degree of control possible over the effect of business cycles on an urban community is greatly restricted due to the fact that such cycles tend to be largely national in origin. The argument runs that as cities grow the similarity between local and national cycles increases. This is, of course, due to a growth in similarity of the local with the national economic composition. The conclusion of this line of reasoning is that local authorities should therefore direct their efforts to support of policies at the federal level which through their influence over wage rates, prices, credit terms, and government expenditure will tend to stabilize the entire economy and hence each urban unit of that economy.[7] Seasonal cycles, on the other hand, in the opinion of these same authorities are more subject to local control.

Opinion relative to the position of local planning and its capacities in the control of business cycle impact on the urban economy is certainly brought into question by the views stated above. It would appear that any attempts at manipulation are very nearly futile. However, there is certainly room for debate on this point. Must the industrial pattern of every major urban community ultimately reflect the proportions of the national economy? On the one hand, this question seems to suggest a levelling of locational differentials which may well be taking place with improvement in the

[6] Cincinnati City Planning Commission, *op. cit.*, p. 23.

[7] Frank L. Kidner and Philip Neff, *An Economic Survey of the Los Angeles Area* (Los Angeles: The Haynes Foundation, 1945), pp. 147-148.

means of transport, communication, and power distribution. Yet it would seem that the urban cells of the national economic organism have from a social and political point of view a sufficient potential autonomy to counterbalance, if they wish, the laissez-faire development of their urban economies. This influence apparently centers over control of entry. Use of this term does not suggest that communities would or could ban the entry of certain economic activities except by such means as zoning, taxation, and licensing . However, it does mean encouragement and promotion of entry of those industries specifically desired for better economic balance. Here again a question will arise concerning the architects and agents of control of entry. With these limitations in mind the discussion will proceed to a brief review of the better known programs of stabilization of urban economies at the local level.

Industrial diversification is one of the better known policy approaches to urban economic stabilization. Its objective is to so diversify the kinds of basic industrial activity within a community that negative swings of the business cycle as they impinge on the smaller economic unit will have the depth and rate of their plunge reduced. It does not appear to be an inherent part of this same argument that heavy positive swings of the cycle should also be avoided on the assumption that there might be a boom-bust relationship present. Among the various means of mitigating the depth of local cycle decline is the familiar policy technique of encouraging a local industrial pattern which has a minimum of activities which on a national basis are subject to excessively fast and deep deflation in periods of regional or national economic recession. This usually means a local industrial structure which gives preference to low unit price consumer non-durables as against the other extreme of high unit price producer durables. In some communities the distinction might be between the necessity and luxury classifications of consumer goods or services. Kidner and Neff make the point in relation to regions that diversification is no guarantee of economic stability:

> "The real question has to do not with the existence of highly specialized industrial development and the consequent dependence upon one or a few principal industries, but rather it has to do with the particular composition of industrial activity in the region governed. One may argue that the particular pattern of industrial specialization is the important factor rather than industrial diversification per se."[8]

A similar observation was made by Roterus when he found that although Hamilton County and the Cincinnati Industrial Area showed good diversity in types of manufacturing and had an average proportion of employment in durable and non-durable goods they suffered far sharper than average declines in manufacturing employment between 1929 and 1933. Further analysis indicated that the explanation for the situation lay in the fact that the composition of the durable goods manufacturing side of the local economy was made up of a very high proportion of extremely sensitive industries such as machine-tools and foundry and machine-shop products.[9]

That diversity per se is not to be pursued as a stabilization policy except in special instances is made clear by the "selective expansion" concept which originated, insofar as this writer can tell, with the Cincinnati study. Selective expansion has two general objectives: "(1) balancing appropriate job opportunities with the present and anticipated labor force of the area, and (2) achieving

[8] *Ibid.*, pp. 148-149.
[9] Cincinnati City Planning Commission, *op. cit.*, pp. 27-29.

the highest possible stability of those job opportunities in order that incomes will be at a maximum."[10] The second objective pertains to both the seasonal and cyclical aspects of employment stability. By now the Cincinnati rating system of depression-resistant, seasonally smoothed, labor-force fitted industries is well known though, apparently, but infrequently used. It is important to note that great emphasis is placed in the selection system on covering the entire industrial field so that personal services as well as manufacturing activities important and suitable to the economy are favored. This is formal recognition of the fact that many of the desirable characteristics of urban economic cyclical stability lie in activities other than manufacturing.

Two other aspects of the diversity argument deserve mention. It is apparent, for example, that in times of depression the urban area which has an adequately diversified economic base will not feel the impact of decline all at one time but will absorb it gradually. This situation comes about due to the fact that the differences in timing, duration, and amplitude of change are likely to be very great.[11] In addition, local dislocations such as strikes can tie up a non-diversified local economy rather quickly, particularly in those cases where one or two unions dominate the employee bargaining of the main industrial firms.

There is, apparently, a belief in some quarters that in particular urban or industrial areas the rate of secular economic and population growth is so rapid that it can offset cyclical fluctuations in the contraction phase. According to students of the subject, the rate of secular growth while often spectacular in its early phases soon begins to level off as the local economy enters maturity, rendering it no less vulnerable than other areas to cyclical dampening.

No lengthy mention is necessary of the fact that if an urban community has an exceptionally heavy proportion of its industrial employment in the relatively non-sensitive consumer non-durable lines it undoubtedly has a great potential in the direction of the expansion of durables without risk of cycle difficulties.[12]

In smaller urban communities problems of scale and diversity (in a somewhat different sense than the one in which the term has been used thus far) appear closely related. An extreme example of this idea is the one firm base or one industry town. Vulnerability is obvious here and the need for planning action is imperative if any degree of stability is sought by the community. However, an increase in local economic scale if applied to the one firm would be planning folly insofar as stability is concerned. Here is a case where diversification per se is probably a sound policy to follow. Difficulties in executing diversification and increase of scale in cases such as this would be evident in highly specialized instances such as isolated communities in which raw materials extraction was the single base activity. It might almost be concluded in this connection that the community with several separate firms all in the same industrial classification is in a more stable position than its neighbor with one firm whose total employment exceeds that of the many smaller firms in the other community.

While, therefore, diversity usually refers to a qualitative range of firms within a community it can also refer to quantity of firms with no qualitative range or a very narrow one. The latter condition while lacking cyclical or industrial sta-

[10] *Ibid.*, p. 64.

[11] Chester Rapkin et al., *Housing Market Analysis, A Study of Theory and Methods* (Washington, D. C.: Housing and Home Finance Agency, December 1953), p. 52.

[12] Homer Hoyt, *The Economic Status of the New York Metropolitan Region in 1944* (New York: Regional Plan Association Incorporated, 1944), p. 24.

bility does produce localized stability of a sort. This develops from the fact that the extremes of stranding or quick outmigration on the part of labor and some aspects of capital when a single firm shuts down is lessened and a redistribution of at least the unemployed labor factor within the community may take place.

Seasonal balancing of local industrial activity can be thought of as a special variety of diversification with, of course, the objectives of employment stabilization on an annual basis and increased purchasing power for the community. Smoothing of the seasonal cycle is considered to be the variety of economic manipulation most likely to succeed as a result of local efforts. If a community is dependent upon a single season base activity it is clear that the annual ups and downs of its economy are traceable to that condition rather than to the longer swings of the business cycle on a regional or national basis. Whereas much seasonal variation in the service sphere of the local economy is either traditional or the result of what is occurring in the base the variation of the base itself is more controllable. The classic Cincinnati study suggests several lines of approach within particular businesses and among industries. A firm can reduce seasonal fluctuation in many instances by "better scheduling of production in advance of orders, addition of new products which can be produced during the slack season in established lines, concessions to encourage customers to buy and stock out of season . . . ."[13] There are, of course, activities which are unable to smooth their seasonal cycle. In these cases it is possible "to dovetail their employment with those establishments whose seasonal fluctuations are contemporary."[14] Another alternative involves the attraction of new industry to the urban area which will accomplish the balancing desired. From earlier analyses in this base series it is perhaps apparent that seasonal balancing of the base may well mean stimulation of sales volume and therefore employment in S without a net addition to the employment total of B. Whether planning of seasonal industry adjustment is done by the local planner, a citizen group, or a combination of the two, the greater chance for immediate and visible results is a factor which makes the seasonal approach a logical first if economic planning of a qualitative character is to be attempted in a community.

In closing this specific set of comments it is appropriate to mention a recently developed institutional factor which may expedite seasonal balancing in some urban areas. This factor is the guaranteed annual wage. Already the automobile industry is contemplating further production integration (geographical as well as organizational) so that it would do more of its presently sub-contracted manufacturing, thus leveling seasonal ups and downs which should, of course, be avoided under a G. A. W. contract.

Yet another phase of the stabilization approach to local economy planning is the fitting or matching of present and future labor force characteristics to industrial jobs. The implication of this approach appears to be that the industrial pattern should be molded by the labor force. This is done in order to reduce the volume and duration of unemployment as well as the inefficiencies of poor fitting that will redound to the disadvantage of producer and employee.[15] The Cincinnati study observed

[13] Cincinnati City Planning Commission, *op. cit.*, p. 32.
[14] *Ibid.*

[15] It has been pointed out in this connection that certain varieties of diversification of industrial activity can implement labor force matching and increase local stabilization. Some activities are able, for example, to use the skills of otherwise unemployed but able wives and teen-age children of industrial workers thus broadening total employment, stimulating S, and stabilizating family group employment.

several tendencies of the labor force in its study area which would require matching adjustments in the future. These tendencies included such items as a proportional increase of women and Negroes in the labor force, a greater percentage of the force over 40 years of age, and substantial shifts of workers from the unskilled to semi-skilled class.[16] Although the concept of fitting or matching is a sound one there appear to be flaws in some of its policy proposals. An essential argument of base theory is that the base molds the character and composition of the urban labor force. It is, of course, recognized in this argument that the existent labor force of an urban area also has a locational pull over basic enterprises contemplating moves. Nonetheless the labor force of a particular urban area is not the only locational pull for most enterprises. Consequently, businesses may leave an area and other enterprises of a quite different character enter it, all because of changes in locational factors other than labor. If the character of the labor force is changing, as described in the Cincinnati report, it is probably in response to social secular trends that exist in part because industrial hiring practices and working conditions already encourage them. Although this is perhaps an overly free market type of argument it appears to this writer that the proper approach is one in which recognition is given to the fact that all or portions of a particular force may reflect an industrial pattern which is unsuitable to a stabilized community existence. Therefore, corrective changes in pattern may mean changes in force. Early changes in force may even involve importation of some personnel in those cases where other locational advantages combined override the disadvantages of assembly and training. Although this variety of solution will result in unemployment it will be of a localized variety resulting in gradual outmigration or other adjustment of the "unmatched" or unadaptable labor force elements.

Any discussion of urban economic stabilization must include at least passing mention of the fact that the shelf of public works advocates are still vocal in support of their plan to lessen industrial area cyclical swings by postponement of major projects until depression. Their arguments from a pragmatic point of view seem less forceful than before. This is traceable to the fact that postponement is often not practical from a public service point of view as for example the need for replacement of a public sewerage system, street resurfacing and widening, and the like. Moreover, the budget difficulties of holding reserve accounts of great size for many years in the face of rising tax rates have been found politically embarassing.

Linkage, Diversity, and Stability. One of the implied advantages of economic diversity within an urban community is the potential of industrial linkage which is likely to develop. In other words, as the range of industrial types grows the attraction of other associated or linked activities is encouraged. Linkage growth is, of course, not only a resultant of variety in industrial activity but also of sound locational relations and of adequate original local industry size within such diversity.[17] The direct relation of critical firm or industry size to the possibilities of linkage can be put forward as an argument in support of a qualitative "scale" approach in planning of local economic activity. However, as the Cincinnati report points out, it must not be assumed that the entry of associated industry is an automatic process. The possibilities for linking may be far from obvious, appear-

[16] *Ibid.*, pp. 64-65.

[17] R. B. Andrews, Mechanics of the Urban Economic Base: Causes and Effects of Change in the Base Ratios and Base Ratio Elements (III)," *Land Economics*, November, 1955.

ing only after long and careful analysis. Linkage or "integration," as the report describes the condition, need not be dependent on a single industrial relationship:

> "For example, it is necessary to determine not only the nature of materials, components and containers used in common by existing firms in the area, but also the overall quantities represented, in order to determine the feasibility of establishing a local source of supply. This supply source might take the form of a fabricating plant or merely a central purchasing organization which is able to secure the economies attendant upon volume buying . . . . other kinds of integration possibilities include: (1) The possibility of using one or more by-products of existing operations to make, or assemble into, a new product. (2) Complementing the production of existing products—for example, printing dress fabrics or making apparel findings. (3) Rendering repair or specialty services to existing production."[18]

While the employment and production efficiency advantages of linkage or integration are clear it is also true that the over-promotion of integration can possibly give a community a built-in sensitivity which will defeat the original objective of stability.

Description of the complexities of economic base linkage and integration in large industrial centers has been spelled out most definitely by P. Sargent Florence. Classification of urban industrial integration by Florence reveals four major groupings:

(1) Vertical integration describes industries performing a series of successive processes such as textile carding, spinning and weaving.
(2) Laterally integrated industries are those producing parts and accessories for an assembly industry or industries.
(3) Divergent integration involves industries which are dependent upon a common local process for their raw material, such as the dependence of lock and gunmaking, chain, cable and anchor manufacture on the proximity of iron casting.
(4) Diagonal integration is descriptive of those industries which serve a number of industries within a community. In a heavy goods center it might involve die-sinking, stamping and galvanizing. Unlike the other classes of integrated industry it is to be identified more exactly with the service portion of the urban economy than with the base. Nonetheless these industries are rather unique in the service category in that their business contacts are almost exclusively with producing firms rather than with the general public. Diagonal integration also involves servicing operations that are absorbed on a rather large scale by single firms, for example, firms which have their own maintenance divisions, medical services and the like. This variety of diagonal integration can, in some instances, materially influence the ratio relationship of B and S.[19]

Florence's classification is, of course, useful in many ways. However, for the planner it provides a particularly valuable means of appraising qualitatively the direction in which his economy is moving or the direction in which he would like it to move in terms of industrial integration. It lends, moreover, further perspective to the field of dynamics of the urban economic base and underlines largely unresolved questions concerning chain reactions within the economy as discussed in the three preceding articles of this series.

Urban Economic Planning Frontiers

There appear to be several areas within the field of urban economic analysis which are, thus far, conceived in rather restricted terms. Before an adequate job of economic planning can be performed these areas must be expanded

[18] Cincinnati City Planning Commission, *op. cit.*, pp. 71-72.

[19] P. S. Florence, *The Logic of British and American Industry* (London: Routledge and Kegan Paul, 1953), pp. 44 and 45; and *Investment, Location, and Size of Plant* (Cambridge: The University Press, 1948), pp. 54-60: also, West Midland Group, *Conurbation, A Planning Survey of Birmingham and the Black Country* (London: The Architectural Press, 1948), pp. 131 and 132.

and in some cases redefined. It will be the purpose of this section of the paper, therefore, to outline the new directions and emphasis that the writer thinks necessary.

Analysis of the productive factors relating to the urban economic base has been standard practice for many years. This analysis has usually been combined with the other key locational factors of raw materials and markets. The intent has been two-fold. One objective was simply that of improving understanding of the local economy. A second purpose centered around the tracing of trends in factor demand, supply, price, and transport cost so that forecasts could be made of the future trends of base activity, of the service function, of population, etc. However, but little attention has been devoted over the years to comprehensive positive programs directed toward preservation of competitive locational advantage and more efficient use of the local factor pattern.

It must, of course, be remembered that local economic planning could hope to influence directly only a portion of the factor picture while it concentrated on support of state and federal legislation to bring about factor influences beyond its immediate control. Those productive and other locational factors which might in many instances be partly under the direct control powers of a locality include traditional land, labor, capital, raw materials, and local transport. The market relation is not included where B is concerned but can certainly be a very real consideration for S.[20] An important exception to this statement in which the markets of B are involved pertains to communities that are trade centers where the customer comes to the community. The planner here has a chance to influence markets directly by specific planning programs for out-of-town customer parking, recreation, and general scale of personal services.

Preservation and promotion of locational advantage is, in a sense, a means of assisting and holding existing local industrial activity but it is more than that in that it is also a means of attracting new industry. The selectivity of new industry attraction will in this instance depend upon which factors are promoted or improved most efficiently.

In relation to the land factor, greater appreciation must be given in the planning process to the fact that zoning of adequate space for industrial and commercial areas, while of great importance, is not enough. More recognition is gradually being given to problems of integration, integration of such areas with streets, trucking routes and terminals, rail and siding facilities, belt lines, parking areas, water transport and harbor facilities, public storage and, finally, with complementary land use not directly involved in the production and distribution process. The entire question of utilities both public and private enters into consideration of the land factor. Whereas most city planning agencies are concerned with problems of sewerage extension and availability of electric power they must, again, give greater weight to questions of expansion potential and competitive interurban installation and operating costs of these items. The same line of argument applies as well to water. Only here the tremendous modern industrial use (and pollution) of water has become a problem not only of adequate supply for the economic side of the community but one also of serious competition with civilian use, domestic and recreational. Within the past few years commercial and industrial redevelopment and renewal have come to be

[20] The degree of mix of B and S elements within a local firm may make the local market factor of great importance to B in an indirect manner.

more specifically considered as techniques for protecting the local economy through rectification of mass structural, site planning, and locational obsolescence. Finally, there is the straightforward question of competitive raw land costs among communities. While this problem can be approached by zoning it may be solved in some instances only by public industrial estate planning. All through this listing of internal factor problems it must be kept in mind that many of the approaches mentioned may be currently executed simply because they are "good planning" in the abstract, the professional thing to do. But they are nearly useless or possibly even harmful if they are not linked to a tangible objective. In this particular case the objective should be not a vague "community economic improvement" program but a plan aimed at (a) holding and possibly advancing the competitive factor advantages of the community and (b) making every effort to correct the outstanding, or developing, weaknesses of those same factors.

Raw material as a productive factor is subject to planning control usually only when it is located in the community. Where this is the case the relation of public planning to the factor is uncertain. If the "raw material" is natural scenery or landmarks which attract a large volume of tourists the case is rather clear cut. Planning action, though it is not always so directed, should be aimed at conserving, developing, and beautifying with, again, the economic objective of maintaining and expanding the tourist flow.[21] There is also the case of extractive processes where the planner may be contending with questions that relate to oil, timber, and mineral supplies handled in the raw state by his community. If these resources are privately-owned and mined, as they most frequently are, the planner's job involves measuring the length of profitable operation life and working out the problems of industrial transition and substitution which must inevitably follow resource exhaustion. On the other hand, he has a chance, too infrequently exercised, of discovering or devising conservation measures that will prolong resource life and thus ease the process of transition. While the community and the planner may exert only the power of persuasion over the mining corporation they may have greater indirect influence via the revision of federal and state resource and tax laws. In many instances the "raw material" involved might be the finished parts or semi-processed output of a locally linked manufacturing operation. The role of local planning toward this particular factor situation might, in addition to appropriate approaches already mentioned, stress the efficiency of movement of goods to the local producer-user.

Capital in terms of the supply and price of loanable funds is subject to but little direct planning control. The community which wishes to increase the supply and reduce the cost of capital investment can attain its end within limits first by so planning its municipal governmental plant and operations that its public credit rating is of top quality. A second, perhaps longer term technique, is that planning approach which through selective expansion and other devices previously discussed develops an industrial climate of such stability and dynamism that capital at low rates and in adequate quantity is naturally attracted to it.

Dominance of private employment in most urban economies results in a limited sphere of planning control over the labor factor. Nonetheless, as with capital, the indirect measures of control can be of great importance in maintaining and

[21] It is, of course, recognized that the objectives of planning in this direction should include the environmental welfare of the inhabitants of the community itself.

improving competitive locational advantage. The problem here must, of course, be viewed from the standpoint of the desire of both business firms and labor force either to stay in the community, leave it, or enter it.

Wage levels and distribution are of importance to all in the labor force and to most businesses. While high comparative levels may attract labor they may repel industry. A "proper" wage distribution or one skewed to the right may, again, be sought by labor and, if not closely related to differential skills, be avoided by industry. A favorable cost of living index is viewed with favor by both groups and may cause labor to accept a lower money wage and less equitable distribution than might otherwise be the case. It can be said that both groups favor amicable labor relations and working conditions but the relations and conditions approved by one group are not always those approved by the other. Finally, labor efficiency, which is undoubtedly sought by all firms, may cause business to be more agreeable to high level wages. But if "efficiency" means speedups and sweated work it will be strongly resisted by labor.

The position of planning relative to these broad considerations involves several approaches. For example, selective expansion as a technique of urban industrial adjustment and fitting, in particular, has as at least one result of its successful pursuit closer approximation of the earnings and skills to the needs and goals of the local labor force. Implicit in the entire factor approach of planning should be, moreover, the idea that the pressure of industrial costs of operation (land, capital, raw materials) will be reduced or stabilized thus leaving more for profits or for an inadequately rewarded factor, in this case labor.

A specific local planning approach to the comparative cost of living status of a community, while involving the factor approach and others discussed earlier, is more directly concerned with manipulation of the S portion of the local economy. Proper analysis of S as of B will reveal its shortcomings such as monopolies, underdevelopment, inadequate management, and excessive factor costs. Certain cost of living elements like food, clothing and fuel—where importation of the finished product is necessary—will be rather difficult to control except in the local physical access and distribution phase. However, others in which local processing plays a more prominent part like housing (cost *and* quality), food items in the class of milk and baked goods, manufactured gas, and water are more subject to control.

Public services are very much a part of the cost-of-living question. One community with a relatively high cost-of-living index may provide public services in quantity and quality to its citizens which more than compensate for the higher index. The efficient planning of public services so that they are kept up to date and even anticipate public needs while accompanied by relatively stable property taxes is thus a means of reducing labor force turnover and increasing the strength of competitive attraction of the area for mobile labor. This line of reasoning applies most directly to school systems, welfare services, cultural amenities, shopping facilities and recreational systems of a city.[22] Much the same approach may be argued for the firms of the base which in some instances are highly sensitive to the adequacy and

[22] William Manchester, "Louisville Cashes in on Culture," *Harper's Magazine*, August 1955, pp. 77-83. Where commuters represent a significant proportion of the labor force and base of an urban satellite area it becomes even more incumbent on the planner to preserve the living climate of the community in order to hold a group which is locationally rather mobile within the metropolitan region.

quality of fire and police protection, street extension and maintenance, public storage, and the like. Traditional planning thought is deficient as it relates to the argument stated above in that its approach to public service planning is either too diffuse or too expedient. In short, there is no very specific yet comprehensive focus for it aside from a physical master plan. The need here, therefore, is for a master plan of public services based more forthrightly on social and economic considerations of preservation and promotion of the economic base and service complement.

One final observation on the factor approach to urban economic analysis applies to the question of sensitivity to cost changes. Adequate local analysis should reveal not only the tendency for a certain factor to dominate a firm or industry cost structure but should also show how sensitive to factor cost change (including property taxes) these economic units are. This does not suggest merely a study of marginal firms and industries but of all local activity, particularly B. With such data at hand, either complete or in sample form, it would be possible to anticipate more precisely the impact of operating cost changes on local economic activities in terms of expansion, contraction, or out-movement whether such changes stemmed from pressures of the free market, or from union or government action.

Conclusions

The mechanics of urban economic planning seem as of the present to be only imperfectly devised. An occasional base study (one per community), an economic inventory, a housing market analysis, all with but few exceptions, give a one-shot, balance sheet view of the economic city. This is adequate only as a starting point. For suitable planning in this sphere what is required is a progressive, year-to-year community economic accounting system. This system should compile a series of all the significant and accessible economic indicators and data that might be used as the raw material for frequent assessment of the local economy.[23] Frequent assessment is imperative if the economy is to be guided, if corrections in economic structure are to be made before it is too late, if scientific promotion of the economy is to be carried on when the competitive time is right.

If an economic master plan of a city is made, this system is one formal means of checking it, changing it if necessary, as might be done with any master plan. But even more important, such a system is one means of following and controlling if possible the dynamic characteristics of the urban economy. It will give the data for point-to-point comparisons in time so vital to dynamics analysis but now lacking. It should, if properly organized as a body of data, show the firm-to-firm, industry-to-industry, and B-to-S interplay that is the significant chain reaction detail which characterizes the whole field of dynamics. Finally, it will therefore give a far sounder basis for decisions as to cause and effect patterns in the process of urban economic change.

[23] The content of such an account system would be local series, with regional comparisons where appropriate, of firm arrivals and departures, of qualitative employment and wage trends, of production, inventories, and sales volume, of shifts in the B and S content of the economy. Regular non-statistical observations would be necessary on the influence of institutional and technological factors, and of the decisions actual and contemplated of local government and business over the economic structure. Progressive estimates would also be required in this connection on the influence of state and federal legislative and executive policies and judicial decisions.

Reports and Comments

Suburbanization: Statistical Fallacy?

I

THE past decade shows every likelihood of going down in American history as a new age of discovery. The discoverers, in this instance, are a multitude of architects and engineers, sociologists and statisticians, demographers and city planners. Their discoveries are the suburbs of America.

News of their explorations has filled the literature. In a series of momentous decisions, the U. S. Bureau of the Census cosponsored the delineation of *standard metropolitan areas*, abandoned the older concept of the *metropolitan district*, and introduced *urbanized areas* to American demography. The Scripps Foundation launched its *Studies in Population Distribution*, running into many volumes and bearing such titles as "Suburbanization of Service Industries Within Standard Metropolitan Areas." Pro-annexation and anti-annexation manifestos, occasionally scholarly and often shrill, appeared in mounting numbers. Builders and architects spoke of "country living" and "suburban comforts." The phrase, "flight to the suburbs," appeared in popular (and technical) writings with almost the same depressing frequency as "grew like Topsy" and a "better place in which to live."

Only three things were wrong with all this activity: (1) The students of suburbia were using maps with an exceedingly crude legend. These maps usually defined the "suburbs" as the territory lying within the outer boundaries of *standard metropolitan areas* but outside of the central cities' city limits. More sophisticated cartographers substituted *urbanized areas* for the *standard metropolitan areas* (or SMA's, as they are termed by the knowing), but with no change in the role of the central cities.

(2) These crudely defined "suburbs" were then treated as meaningful entities. They were endowed with social, demographic, economic, geographic, political, psychological, philosophical, and religious significance. Detailed cross tabulations were made, embracing every SMA in the Continental United States and (sometimes) Hawaii. High-powered statistical techniques—multiple regression, partial correlation, the analysis of variance and covariance, and others—were applied with great precision and care. The findings were issued in well-publicized monographs, pregnant, it was implied, with ecological meaning.

(3) Finally, suburbia and all it portended were treated as a strikingly new phenomenon. Deluded by their definitions, inundated in data, the discoverers decided that the "flight to the suburbs" was a postwar creation, like Cinemascope and polio vaccine and the H-bomb. Their attitude was typified by the popular magazine which announced: "In a ten-year survey recently completed by Cornell University's Housing Research Center, it has been revealed that U. S. growth patterns have completely reversed a century-long trend—that the population of the suburbs is now increasing faster than the city population. . . . . The change started during World War II . . . ."

II

Let's look at the definition. The basic distinction made here is between central city and the "ring," or part of the *standard metropolitan area* beyond the city limits of the central city. Is it a proper and realistic distinction?

Often, admittedly, it is, at least when properly interpreted. The Bureau of the Census and its sister agencies unquestionably went to a good deal of effort to identify "central cities" and define their metropolitan boundaries realistically. Almost without exception, these central cities differ from their rings in at least two important respects, namely, in political control and public finance. (I say "almost" because at least one SMA, Honolulu, is under a single political and fiscal control in its entirety.

Even here, however, a central city is recognized by statute for statistical and administrative purposes.) The distinction between core city and ring when regarded in this light is a real one, not likely to be misinterpreted. What has meaning for the student of political science or public finance will not, however, be equally significant for analysts with other orientations.

Two notions are implicit in the present use of the term "suburbs." One is that of peripheral location, on the outskirts of an urban core. The other is one of intermediate density and land use. The suburb has gardens but few farms, stores but no central business districts. Population per square mile is neither that of the open country nor that of the close-in slum.

The corporate limits of the central city or cities are, I submit, an exceedingly arbitrary measure of where the suburbs begin. Densely populated residential areas, major shopping centers, large factories, and all of the other core characteristics are found with increasing frequency on the far side of the city limits. Often these "suburbs" lack only municipal government. At the same time, their central cities may (and often do) contain undeveloped areas within their corporate boundaries, areas more suburban in land use and density than the "suburbs" farther out. Sometimes, in fact, these central city suburbs lie farther from the central business district than do many parts of the SMA ring. This seeming paradox occurs when annexation proceeds lopsidedly.

Such apparent inconsistencies are rapidly becoming the rule. In the Cincinnati SMA, for example, Norwood and Covington, both in the ring, are closer to the metropolitan center and have higher population densities than most sections of the central city. The closely-built but unincorporated residential district adjacent to the northern city limits of Seattle (as of 1950) was more urban in character than West Seattle, long part of the central city. Similar examples can be found throughout the country.

Not all of the urban analysts are unaware of this problem. Two of the most prolific contributors in suburbanization research, Evelyn M. Kitagawa and Donald J. Bogue, have written, for example: "The present dichotomy of 'central city' and 'ring' is grossly inadequate, but was used in this study [of the suburbanization of manufacturing activity] only because there was no alternative. It is vulnerable to the vagaries of annexation, the accidents of historical decisions about boundaries, and other factors that weaken statistics published only in terms of these two units." This realization, unfortunately, has not been shared, to judge from the current literature, by many of their colleagues, nor, in fact, has it appreciably diminished the output of either Kitagawa or Bogue in this field.

It is in studies of trend that the central city-ring dichotomy becomes most misleading. Granted, it often serves fairly satisfactorily for the analysis of crude geographic relationships where data are confined to a single point in time. Its application to long-term time-series is something else.

There is nothing new about suburbanization. For at least a century, large American cities have grown chiefly by peripheral accretion. Population has always increased more rapidly on the outskirts than close to the central business district. Retail trade and consumer services have been decentralizing for decades. Suburbanization is old stuff.

One fact is new: the failure of the central cities to extend their political boundaries at the same pace. Fragmentary data indicate that this political lag is relatively recent. Peripheral urbanization occurred almost as rapidly in many 19th-century cities as in their modern counterparts, but seldom with so little adjustment of municipal boundaries. Annexations appeared to take place with the same speed as burgeoning suburbanization, in many places as recently as the First World War.

The analysts, alas, seem to ignore this. They tend to look on suburbanization as totally new, and their writings betray this impression. A footnote or two, somewhere, somehow, may prove their innocence of my charge, but can do little to erase the general impression these studies create.

III

What can be done? First, we must abandon the central city-ring duality wherever it doesn't apply. As noted earlier, it can prove extremely useful in studies of public administration and finance. In other instances, it is far less apt in most social, demographic, economic, and housing research, for example. Our chief concern in the latter instances is more often population

density, or peripheral location, or the clustering of business establishments.

Second, we can revise our thinking to jibe more closely with the specific problems that we have in mind. If our interest is the increasing distance between home and work, or home and shopping, or any other time-space relationship, we should tabulate our data by peak-hour driving time, or bus distance, or whatever may best serve our ends, rather than resort to the indirect measure of location with respect to the city limits. If a problem involves population densities, let's express it in terms of density, instead of the crude central city-ring breakdown.

Third, we can expand our use of the census tract concept to facilitate this kind of analysis. As Kitagawa and Bogue have said, reliance on the long-outmoded central city-ring dichotomy, "grossly inadequate" or not, is imposed by the lack of anything better. This statistical impasse, fortunately, is rapidly being overcome. Most large cities and, in many cases, their adjacent territory have now been tracted. Census tract areas, densities, and driving-time relationships can frequently be obtained from city planning commissions and similar municipal agencies. Tabulation of Bureau of the Census statistics of the tract-by-tract distribution of population and housing characteristics is now routine practice, and shows promise of being followed by corresponding tabulations (already accomplished in some communities) for retail trade and other economic activities. There will be no excuse, other than laziness, for continuing in the old, crude duality.

Finally, we can try to reconstruct small-area data for earlier years, to test whether suburbanization, strictly defined, is indeed a postwar phenomenon. The present paper has taken a somewhat dogmatic (and perhaps overstated) position in opposition to the current view. It would be unreasonable, however, to expect to trace the present trend, intact in all its details, back as far as (say) the turn of the century. The need for further research is a social and statistical truism, but may bear reiteration in this regard.

Whatever we do, however, let us remember: (1) city limits have only political and fiscal significance, more often than not; (2) the central city-metropolitan ring dichotomy is an extremely crude and limited index of most urban relationships; (3) there's nothing new about suburbanization.

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A Further Note on Suburbanization

APPARENTLY Mr. Schmitt is objecting primarily to the popular failure to reserve judgment on the nature and significance of certain trends until they have been subjected to empirical measurement. If so, one must agree with him. The tendency to rush to dramatic conclusions on the basis of insight, casual observation, or limited experience is unfortunate, though it appeals to hungry journalists and others seeking to publicize a cause. Many of the assertions about suburbs and suburbanization currently heard are certainly extravagant; at least they are made without benefit of systematic observation. A good example is the claim that what is now occurring in metropolitan areas originated after World War II. If Mr. Schmitt's remarks contribute to greater restraint in the pronouncements on what is happening in urban areas, then he will have performed a useful service. But Mr. Schmitt makes a few extravagant statements of his own. Let us consider some of these briefly.

Whether a place is a suburb or some other kind of urb is strictly a matter of definition. There is no fiat on the subject. And, in the absence of an authoritative dictum, everyone seems to be enjoying his freedom. Suburbs are variously regarded as cities or villages that are subordinate to other, larger cities; as ill-defined areas that are subordinate to cities; as villages or cities that are not yet fully developed; and in a miscellany of other ways. Since the denotation of the term is obscure, one is unable to say categorically that there is nothing new about suburbanization. True it is that ancient Rome was ringed about with villas—and medieval Paris had its *faubourg*. Although these early instances of suburbanization, if that is what they represent, may have been the same in principle, they may have differed significantly

in scale from the modern phenomenon. The simple fact that large cities are encountering increasing difficulties in their efforts to expand their boundaries suggests that something new may have been added in the centrifugal drift of population.

As a matter of fact, there seem to be several elements of novelty in recent trends. The data show that down to 1920 the principal direction of movement of population within metropolitan areas in the United States was centripetal. The populations of central cities grew much more rapidly than did the populations of their adjoining areas. Many parts of the adjoining areas actually lost population between 1900 and 1920, supporting at least the tentative inference that central city growth proceeded at the expense of the immediately adjacent territories. The reversal of this trend occurred after 1920 and has persisted to the present![1] Thus, viewing the metropolitan community as a whole the pattern of population redistribution that has been developing since 1920 is unlike that which prevailed prior to that date.

Mr. Schmitt is correct in his statement that urban growth has almost always tended to be peripheral in character—the outer edges of built-up zones within cities have grown more rapidly than have the interiors. In the past, however, this phenomenon has been localized. The relatively inefficient facilities for short-distance or intramural movements available throughout the 19th century and in the first two decades of the present century restricted the space over which population could scatter without loss of access to a common point. The same circumstances produced high densities of settlement and use within developed areas.

A second important point of difference between the present (i.e., since 1920) and the past is to be found in the scope of the territory over which the population of a single urban unit can and is scattering. Unlike the past, peripheral growth in recent decades shows a conspicuous tendency to ignore contiguity. Of interest is the fact that the increases of growth rates in the satellite areas or rings (sic) relative to the rates in central cities have varied directly with distance within a radius of approximately 30 miles.[2] Granted the merit of the urbanized area concept, it omits a very substantial part of the metropolitan population, a part which promises to become an increasingly larger proportion of the total.

Related to the enlarged scope of the present-day urban unit, i.e., the metropolitan community, is another more or less unique factor, namely, the inclusion of a multiplicity of governmental units within the orbit of a single, functionally integrated population. It would be unwise to relegate this administrative and fiscal confusion entirely to political scientists and public administrators, thereby reading it out of the sociologist's, the economist's, or the demographer's ken. However arbitrary they may be, political boundaries have important implications for many aspects of organized activity that do not fall neatly into the political science compartment. The redistribution of population, housing, industry and other urban activities is unquestionably influenced by the juxtaposition of dissimilar political units. Problems of public health, of the maintenance of order, of the preservation of real estate values, of zoning and planning, though they are the stuff of public administration, they are not by that token divorced from the interests of social science at large.

By and large, Mr. Schmitt's research suggestions are sensible. Obviously research should be designed to demonstrate what it purports to demonstrate and the more precise are the indexes and the measures used the greater confidence one can have in the results. Whether census tracts satisfy any standards of precision in comparative research is debatable. To this writer they represent a miscellany of small areas with no perceptible rationale other than that a great amount of highly useful census data is tabulated for them. Since the 1930's urban and metropolitan research has moved progressively toward a quantitative design which enables it to yield generalizations about aggregates of cities or metropolitan areas. In view of this healthy though tardy development much of the data available in planning commission files has a very limited utility. The definitions and the classifications employed are usually adapted to local needs rather than to the criteria of inter-unit comparability. The growing emphasis on generalized findings also raises questions concerning the statistical importance of the

[1] Almos H. Hawley, *The Changing Shape of Metropolitan America*, (Chicago: The Free Press, 1955).

[2] *Op. cit.*

"Norwoods," the "Honolulus" and other isolated exceptions. Unless one can show that deviations from a central tendency exceed the limits of tolerance, the occasional exception is merely a subject for anecdotal interest. Stated in another way, as much restraint should be exercised in attributing importance to exceptions as in making unsupported generalizations.

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Estimating Aggregate Residential Real Estate Values From Population-Income Data

THE valuation of residential real estate has two aspects; that most familiar to the general public is the "appraisal" problem —the setting of a value on a particular piece of property for the purpose of sale or assessment. The second aspect, which is growing in importance, is the aggregate valuation, which might be called the "market area" problem—the setting of a value on an entire residential area for market research purposes and as an aid in the planning of public improvements sometimes associated with changes in local tax structures.

The objective of this note is to contribute to and to stimulate discussion of how to estimate aggregate real estate values. Some of the techniques used in individual valuations have been used in market area studies for the valuation of aggregate real estate values. Others have not. This note is an attempt to extend the area of mutually usable techniques by applying the "income concept" as a feasible method to the valuation of aggregates.

The "income concept" is recognized by most writers as one of the most important estimates of real estate values.[1] In general, the income concept includes the sum of the present and capitalized future values derived from real property. Despite this recognition of the income concept as an indicator of value, it is used only rarely for individual residential real estate, and then mostly complementary to other methods, and it is used even less often for aggregate residential real estate valuations.

Probably the outstanding reason for not using the income concept more often for aggregate valuations is the paucity of aggregate income data. The income concept is considered to be especially inapplicable for non-commercial residential property because of the absence of explicit income derived from it. A further reason which may account for the neglect of the income concept for the purpose of aggregate real estate valuation is the tendency on the part of researchers to prefer working with individual appraisals as contrasted with aggregate valuations of areas comprising many properties.

These reasons for not utilizing the income concept are partly invalidated by further considerations and by recent developments. First, some income information has become available since the 1940 U. S. Census and has been further expanded in the 1950 Census. Further expansions are to be expected.[2] In addition, local planning groups, in recognition of the importance of income differentiation, have developed techniques of collecting and analyzing income data. Secondly, the study of family expenditures and budgets has opened the way to deduce residential property values from incomes. Thirdly, with the growing awareness of macro-relationships, aggregate real estate values have become more important. Examples are studies of national or regional wealth and studies concerned with increased land values as a consequence of public improvements.

Actually, the value of real estate is derived from population and income, and from no other source. It may be a function of site, access, climate, topography, waterfront footage, distance from schools and shopping districts, or any of the large number of other

[1] See for example, Arthur M. Weimer and Homer Hoyt, *Principles of Urban Real Estate,* (New York: The Ronald Press Co., Rev. Ed. 1948), p. 19; Richard U. Ratcliff, *Urban Land Economics* (New York: McGraw-Hill Book Co., 1949), pp. 347-349; Arthur A. May, *The Valuation of Residential Real Estate* (New York: Prentice-Hall, Inc., Second ed., 1953), pp. 173-185.

[2] The August issue of the United States Department of Commerce, *Survey of Current Business* each year contains annual income data by states which could be used as a set of correction factors for census data and for inter-decennial adjustments. These annual figures are available from 1929 to date.

physical characteristics. But the value is related to these characteristics only indirectly, whereas population and income are directly related to value. The value of the property in this pecuniary world can be assumed to be identical with the money paid for it, through budget allocations, by all the households occupying the property. The more households in general the larger the sum of their appropriations. The value of real property, then, is a function of the density of population and the income of its occupants.[3]

The value of income property such as land in commercial and agricultural use is based upon its earning power more explicitly than is that of residential property. Residential uses of land, however, have a place in the same scale of income productivity by which commerical and farm land is measured. This paper is an attempt to demonstrate that valuation based on aggregate income, which is the obvious measure of income property, is applicable also to residential property.

Measurements of land value aggregates by most investigators have relied on assessment valuations,[4] on summaries of individual sales prices,[5] on opinions of property owners[6] or real estate brokers,[7] or on a combination of these methods.[8] None of these methods are wholly satisfactory for the measurement of value aggregates. The disadvantage of obtaining land values through opinion polls is obvious; assessments and sales prices also contain serious weaknesses.

Appraisals made for local tax purposes represent necessarily many rules-of-thumb and are intended to reflect the relative values of many pieces of property, rather than their actual value. Consequently, assessments do not provide an objective measure of land values at a given moment. Aggregate valuations are not concerned with the value of particular pieces of real estate, the main objective of assessment valuations. What is desired is almost the opposite of an assessment valuation; it is the actual value, at different moments of time, of all real property within a specified area.

Sales data show the valuation put on a property by the purchaser and are objective statements of value for that property. By using bona fide sales of real estate as a sample the value of surrounding property can be inferred. This procedure falls short of a complete, objective measure of value. If all the property had been sold in the area and during the period or periods under study, then the sales method, though awkward and laborious, would produce the desired index of values. Of course, this condition is never fullfilled since sales volume varies widely over space and time. Sales used as a sample are therefore a weak, albeit sometimes the only possible method of estimating real estate value.

Residential real estate, however, has the characteristic of being "sold" implicitly. The occupants of a property are required to pay for the use of the property in weekly, monthly, or annual installments, whether they own or rent that property. Their payments are in the form of appropriations from their household budgets—allocations of their family income to provide shelter. Each time that income is received, by any family or independent individual, part must be set aside or paid out directly for rent, mortgage installments, or some other form of payment for

[3] Density of population alone is a necessary but not a sufficient land value indicator. Equal density of population with unequal incomes need not produce equal or similar land values. On the other hand, aggregate income as measured by population and income does correspond to land value. This is similar to Ricardo's intensive margin generalized to mean that the larger the production of dollars per areal unit, the higher the value of that unit.

[4] Edwin H. Spengler, *Land Values in New York in Relation to Transit Facilities* (New York: Columbia University Press, 1930); Louis C. Wagner, *Economic Relationships of Parking to Business in Seattle Metropolitan Area* (Highway Research Board, Washington, D. C., 1953).

[5] Homer Hoyt, *One Hundred Years of Land Values in Chicago* (Chicago: The University of Chicago Press, 1933); Norris Engineering Co., Texas Highway Dept., U. S. Bureau of Public Roads, *A Study of Land Values and Land Use Along the Gulf Freeway of Houston, Texas* (Austin: Texas Highway Department, 1951); E. P. Winter, *The Effects of the Relocation of a Cross-Country Highway on Land Values, Land Transfers, and Land Uses* (Madison: The University of Wisconsin, Unpublished Ph.D. Thesis, 1954); Washington State Council for Highway Research, *Nature of Highway Benefits* (Progress Report), Section 6: "Rural Property Values;" Section 7: "Urban Property Values," (Seattle: Washington State Council for Highway Research, 1954).

[6] J. L. Tennant, *The Relationship Between Roads and Agriculture in New York*. Cornell Agricultural Experiment Station Bulletin 479, Ithaca, 1929; W. M. Curtiss, *Use and Value of Highways in Rural New York*, Cornell Agricultural Extension Farm Economic Bulletin 88, Ithaca, 1936; Wells M. Allred, *Analysis of Highways in Rural New York* (Ithaca: Cornell University, Unpublished Ph.D. Thesis, 1951).

[7] A. K. Branham, A. D. May and H. L. Michael, *Economic Evaluation of Two Indiana Bypasses*, Highway Research Bulletin 67, Washington, D. C., 1953.

[8] Paul F. Wendt, *Central City Property Values in San Francisco and Oakland* (Highway Research Board, Washington, D. C., 1953).

living quarters. These payments, whether made to a landlord, a bank, an insurance company or to the family itself as imputed income, are in reality parts of the purchase price of the property regardless of when the property is legally sold. By these payments the owner of rented land recoups his original expenditure, the mortgagee is repaid, or the private savings of the family are restored.

In a particular residential area the total annual payment for the use of real estate, regardless of the form of ownership, is limited by the total income available for housing expenditure among all the households having residence in the area. Except for temporary distortion introduced by fixed contractual payments during periods of changing price levels, the aggregate amount which is paid out as real or imputed rent during the course of a year is, when capitalized, the actual value of the property.[9]

Population has a large degree of mobility over a period of a decade or more within an urban area. If the rent charged for a particular residence exceeds the value of the services which it yields, tenants will not be willing to remain there and rents will fall. If the price is too low, potential tenants will think it a bargain for the advantage which it possesses and the price will be bid up. The owner-occupier need not pay himself rent but the effect of increased or decreased values must be considered by him also. If his property becomes very desirable and rises in value while his income-status remains the same he is likely, after a certain lag, to sell or rent his property and live elsewhere, "moving down" to a place more suited to his means. Until he does so he is sacrificing potential satisfaction according to his scale of marginal income allocation. If, on the other hand, his property drops in value while his income-status remains the same, he is likely to "move up" to a residence which is better suited to his means. In all these cases the essential feature is the relation between an individual's income and the rent he pays, whether it is direct outlay or imputed. Each income-receiver must allocate a portion of his income to provide himself and his family with living quarters. The amount which he so budgets for a dwelling-place depends on the size of his income and on his idea of the proportionate needs of all the categories of his expenditure, food, rent, clothing, etc.

This relationship between population-income and the value of real property is temporarily interrupted by the activities of the speculative buyer of real estate, whose income may be larger or smaller than indicated by the "correct" proportion between income and the value of real property. But since the speculator, by definition, buys in order to sell, the value of the property will revert to its proper relationship to the income of owner or tenant. Regardless of what speculators are asking, they must, if they want to sell, consider the income of the residents whom they wish to attract. Therefore, the statistics of population and income which refer to the resident population whose major purpose is to occupy the real property will reflect the value of real estate.

In a residential area, real estate produces services which are purchased by its inhabitants; each family group using up its allotment of housing. Out of each family budget comes an amount which buys the family's share of these real estate services, of the shelter, convenience and amenities which real property provides. The total of these individual budget allocations for one period, say one year, is the price and hence the market value of services produced per given area and period. Budget allocations by the families living in the area and also by the families in the surrounding areas thus place a value on the services and co-determine the value of the land. Budget studies indicate that American families make housing appropriations from their incomes in a fairly uniform way.[10] Families within an income bracket tend to make very similar percentage allocations for housing although the percentage differs among different income groups.

To summarize, the aggregate amount of family budget allocations for housing depends on two factors: the total population of the area (in family units), and the amount allocated by each family. The second factor depends upon the size of the total income of each family and the proportion of total in-

[9] Gross rent is the appropriate concept for residential property. For a distinction between the use of gross and net rent, see: Arthur A. May, *op. cit.*, p. 178.

[10] See for example, publications of the Heller Committee for Research in Social Economics of the University of California and by the United States Dept. of Labor.

come which can appropriately be set aside for housing.

The use of population and income data would result in an approximate value of all real estate in the area under study. It would be approximate inasmuch as the budget ratios of expenditures for housing within each income group would be assumed to be uniform and identical with the national or regional average ratio. The aggregate approximate value would approach the exact value if a comprehensive survey of the actual rates of expenditures for housing among the households in the study area were made. It is unlikely that such a survey could be made but it is possible to make sample tests in the study area of the general and approximate validity of national and other average budget housing expenditure ratios.

The use of the population-income concept is complicated by the paucity and inconsistency of income information presently available and by the fact that, where income data are available, they often refer to different areas in different periods. An example is the change in the census enumeration between 1940 and 1950 from a precinct to a tract basis and from the basis of reporting median rent to that of reporting median income. These technical obstacles, great as they may be, can be surmounted. This is illustrated by the following generalized example based on the 1940 and 1950 U. S. Census: The aggregate income in 1950 can be estimated by multiplying the population (number of families and unrelated individuals) in the census tracts by corresponding median income, both figures taken directly from the 1950 census of population.[11] The aggregate income in 1940 can be estimated by multiplying the number of households per precinct by the median monthly rent taken from the 1940 census of housing (times 12), dividing the product by the estimated average budget percentage allocated to housing expenditure. Often this aggregate income figure relates to a different geographical area from the 1950 aggregate since the method of enumeration has changed from precincts to tracts. An adjustment for this factor can be made by determining the approximate portion of the 1940 population which resided in the overlapping 1950 census tracts. Occasionally, local planning bodies will have this information available. Based on aggregate value estimates in different periods, percentage comparisons and indexes can, of course, be developed.

Two of the greatest advantages of the population-income method for estimating real estate values are its relative speed and economy compared with other methods, and the fact that it accounts automatically for differences and changes in improvements over space or time, a major obstacle in the valuation of aggregate real properties. One of the shortcomings of the population-income method is its finite space-time limitation circumscribed by the 10-year interval of census enumerations and by the size and distribution of the enumeration districts. Within these limitations, and even beyond them if an effort is made to furnish additional data, the population-income method can fill an important gap in the estimation of aggregate residential real estate values.

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[11] Because of the under-reporting which is inherent in all income-census taking, market research organizations sometimes apply an upward adjustment factor to such income data. It is possible to offset the tendency for median income to be on the low side in typically skewed income distributions by taking, for example, an income of $400.00 to represent the lowest bracket ($0 to $500.00) and an arbitrary $12,500 to represent the open-end upper bracket (over $10,000). Since a significant proportion of the total number of households does not report, the over-all average income of those reporting can be applied to the total number of households including those not reporting.

The Teaching of Real Estate and Business Administration

THE teaching of real estate has been expanding in the postwar years but the subject is still given only limited recognition by Schools of Business Administration. Yet the administration of real estate resources by most modern business firms, while secondary to such basic functions as production and marketing, certainly appears to rank in im-

portance with the administration of advertising, personnel, purchasing, insurance, and many other phases of business operations.

Why has the area of real estate been accorded only limited recognition by our Business Schools? Is it because the subject matter is too specialized? Is it included with other subjects such as business finance? Is it because trained instructors are not available to teach in this field? Or are there other reasons?

It may be that the principal reason for the relatively limited attention given to the real estate field by our Schools of Business Administration is the point of view from which most courses in this field have been or are being taught.

Typically, courses in real estate are taught either from the point of view of land economics or from the standpoint of the real estate business itself.[1] It is contended here that a more appropriate approach to the teaching of real estate courses is that of the business manager or administrator.

Greater emphasis should be given than is now the case to such topics as the place of the real estate function within the organizational structure of the modern business firm, the relationships between the administration of real estate and other functions performed by the firm, the basic characteristics of real estate which have a bearing on managerial decisions and the techniques of analysis which may be used to reach sound managerial decisions involving real estate problems.

This suggestion would not eliminate courses in land economics or those dealing with one or another phase of the real estate business itself. But it would result in shifting the major emphasis to *real estate administration* as an essential sector of the general field of business administration.

There are several precedents for such a development. For example, the early courses in finance grew out of the field of money and banking. Subsequently, the area of corporation finance was given primary attention. More recently courses in business finance have developed which consider the financial policies of a firm from the standpoint of its central management and administration. Courses in specific areas of the field such as banking, security analysis, investments and the like continue to be taught. Similarly, the more general theoretical courses in money and banking and the money markets continue to be offered. But the basic or core course in Schools of Business Administration has tended to become business finance or the management of business finance.

Much the same type of development may occur in the real estate field. It is probable that, until the central viewpoint shifts to real estate administration and away from land economics on the one hand or such courses as real estate brokerage, appraising, property management, building and land development on the other, the area will not be accorded by Schools of Business Administration the recognition that it deserves.

Such recognition can be justified in terms of the importance of real estate to other aspects of successful management and administration. Plant location, production management, marketing, retail outlets, advertising, and financial administration, including tax problems, are all closely related to real estate. A modern manager without knowledge of real estate is almost as helpless as if he had no knowledge of personnel.

The sheer size of the investments of many firms in real estate is itself a strong argument for giving greater attention to this field. Typically, real estate assets represent major portions of the capital investment of manufacturing, retailing and many other firms. The peculiarities of the tax problems alone would argue for giving greater emphasis to the real estate area.

In short, the central theme of the real estate courses offered by the School of Business Administration should be the development of the necessary knowledge and ability to enable future business managers to deal effectively in this area and to make sound decisions regarding the purchase, use, leasing, development, and financing of real estate resources in the operations of a business enterprise. The approach to such studies should be essentially the same as that used in sales management, production management, personnel administration, financial management and related fields. As pointed out above, it involves the study of the subject from the administrative point of view.

The administrative viewpoint differs from that of the physical or social scientist. It is concerned with the accomplishment of desired results through human effort. It in-

[1] See, for example, Paul F. Wendt, "Real Estate Education at Colleges and Universities," *Journal of Property Management*, Summer 1955.

volves selection among alternative courses of action. It includes the processes of planning, organizing, motivating and controlling operations with a view to achieving desired results.

This point of view was explained very well by Dr. Robert D. Calkins, President of the Brookings Institution, in a speech to the members of the American Association of Collegiate Schools of Business in the spring of 1955. He contends that administration is a subject quite different from the social sciences out of which many courses in business administration have evolved. To quote from his speech in greater detail:

"Administration is fundamentally the direction of affairs. It is purposive action, and to an increasing degree it is informed, rational, and deliberate action. It draws upon the knowledge of the physical sciences and the practical arts; it employs the knowledge and techniques of the social sciences; but it is overwhelmingly concerned with the choice of ends, ways, and means for the attainment of desired results. It is curbed by moral codes and ethical principles; and it is driven by springs of ambition and devotion that largely escape analysis.

"The process requires the use of knowledge and understanding, but the ultimate objective is not explanation and understanding as it is in science. Its goal is not knowledge for knowledge's sake. Nor is its end any intellectual quest for the joy of discovery. The end of administration is the achievement of purpose; that purpose is action which yields desired results. Administration is inescapably concerned with choice and action, and it is therefore concerned with the future consequences of action.

"The three main elements of administration are the formulation of goals, the choice of ways and means, and the direction of people in some group purpose. These activities may be considered as consisting mainly of two processes: the process of decision-making and the process of execution, or action. The former determines what is to be done and how, while the latter puts decisions into action and oversees the process."

The point of view so well presented by Dr. Calkins may have considerable significance for those interested in the teaching of real estate, particularly those who are members of the faculties of Schools of Business Administration.

As a case in point, consideration may be given to the development of a graduate seminar in Real Estate Administration at Indiana University during the postwar years. In this seminar the point of view is that of the business manager or administrator. The work deals with the administrative process in general and relates it to problems growing out of the administration of real estate resources. It includes techniques of analysis which may be used in arriving at decisions affecting property location, markets and market outlets, and the purchase, use, sale, leasing, development and financing of specific properties within the framework of a business firm's operation. The general administrative viewpoint is related to the administration of real estate firms and agencies as well. Attention is given to the conflicts of interest between the public, governmental agencies, customers, investors, owners, managers, and employees. Differences between the private and public administrator in the real estate field are considered.

This seminar has proved to be a stimulating approach to the consideration of numerous topics in the real estate field. It suggests that the administrative point of view may be an effective approach to the teaching of real estate on the undergraduate level. This approach is being tried, to a limited degree, in the basic undergraduate course at Indiana University currently. However, its use will have to be restricted until the necessary text and related study materials can be developed.

Case studies will be of special importance in such work both for graduate and undergraduate courses. Such cases should be based on current real estate problems of business executives. They should stress the point of view of the general business administrator rather than pertaining to specific properties or specific real estate practices. Special emphasis must be placed on the collection of cases in the immediate future if the administrative point of view is to develop as an effective approach to the study and teaching of real estate.

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The Urban Economic Base Reconsidered

LIKE old shoes, traditional concepts in economics are more comfortable. New ideas and tools are apt to be upsetting. Eventually, if the concept has merit, the resistance wears and the idea becomes part of the economist's medicine chest, perhaps in modified form. This is one path in the development of doctrine.

In recent years the concept of "the urban economic base" has appeared. Certainly among those people concerned with urban economics, the concept of the base has made some impression. Writers on and users of the base technique do not claim perfection, for both the theoretical concepts and empirical methods are not much past the embryo stage.[1] But the core of the idea seems to be well developed. It is vital that we see how it fits within the general framework of economic analysis before complete acceptance.

This paper will attempt to place the concept of the base within the more conventional framework of modern economic analysis. We believe our analysis will place the base theory in a perspective, more valid as a description of urban economic reality and more operational in terms of urban economic research. The development of the paper is: (1) the objectives of base studies are set forth; (2) an analogous situation for the national economy is presented; (3) the theory of the base, and (4) some misgivings about current usage of the base concept.

Objectives of Base Study

Properly speaking there is no single criterion for using the base concept. Any urban investigator is free to use the base for whatever purpose he has in mind, subject only to the restraint that the use makes sense. Yet the use of the base idea, even in modified form, necessarily commits the researcher to certain, albeit implicit, statements about the urban economy. This is merely another way of saying that the urban base approach is a framework of analysis. It is, of course, impossible to study all aspects of the urban economic totality in detail. Some method of aggregation is essential. The simple listing of urban employment by industry types according to the Standard Industrial Classification is one type of aggregation. The conceptual framework of an input-output table is another. The classification according to exports vs. local use is still another. Which technique one uses depends on the nature of the study.

The basic vs. non-basic method is one more framework. Supposedly, it is useful because it points up cause and effect relations in critical areas of the urban economy. As usually discussed, these areas deal with employment and /or income, somehow measured, in the urban community. These are items which relate to the general health or general economic welfare of the area. Thus it may be argued that the base approach is useful in pointing up the forces determining the level of general economic welfare in the community.

In turn, this leads to the question of just what magnitudes best indicate the level of general welfare. This issue is old hat to economists. It is delightful since it has no solution. Probably, if a vote were taken among economists, some form of income measurement would win. Insofar as other variables, such as employment, industrial production and the like, move in the same direction, it does not make too much difference which measure is used. But income, especially per capita with some knowledge about its distribution, is probably the best single measure.[2]

Forgetting for the moment the statistical problems involved, we can say that the base approach is a useful framework because it helps to explain the level of income of the economy. Not only does it measure, when basic and non-basic activities are added together, the level of income, but supposedly it helps to explain sources of variation in income. Since so many of the activities of a community, both public and private, are tied to the level of income, this can be a powerful tool.

Yet a word of warning is in order. The base concept cannot explain everything, and in one case is weak in explaining income

[1] For a fair appraisal of the weakness of the base, conceptually and operationally, see: Richard Andrews, "Mechanics of the Urban Economic Base," *Land Economics*, May 1953 continuing.

[2] For a discussion of other, but associated criteria see: Richard Andrews "Mechanics of Urban Base: The Problem of Base Measurement," *Land Economics*, February 1954, pp. 52-60.

levels. This is the case of secular growth and factor endowment. By analogy, we know two things happen in the national economy: (1) we grow in possible levels of output and (2) we do not always produce at capacity. In fact, we rarely do. If one is talking about income levels in India vs. the United States and seeks to explain the difference, the obvious answer is poor vs. rich factor endowments. On the other hand, if one is concerned with changes in incomes (cycles)—given the factor endowment—the level of investments, consumption and so forth, are the key variables. A third way of viewing this difference is to consider the level of income in Chicago vs. some southern city. This is again a question of factor endowment. In Chicago changes in income from year to year, however, may be considered another problem. The base concept is useful in the case of income change, but of much less use, as will be shown, in the case of secular income discussion.

In summation, the base concept is useful as a framework of analysis in aggregating urban economic activity. Its advantage over other frameworks is that it points up the interactions of the local economy in a meaningful manner. At least, that is what the base technique is supposed to do.[3] The only problem is, as usually formulated, it does not. In order to see why it fails to provide a meaningful aggregation, it will be necessary to look at the same problem the base approach is trying to solve at the national level.

National Income Forecasting

One of the favorite hobbies opened to economists is that of predicting national income. Obviously, in prediction one must explain something about the nature of the changes which raise or lower the national aggregates. In other words, one must have some idea of how the economic system works. This does not imply that all forecasters use the same method. In general, there are two methods of predicting income levels. One uses selected indexes which seem to show leads in the terms of national income. New orders, common stock prices, are examples of indicators used. A second approach is to set up an econometric model of the economy. These may be simple systems or may involve many equations and unknowns. Implicitly, most discussions of the urban base are simplified econometric models. It is worth a moment to explore the innards of these creatures to see their basic ingredients. In this manner base studies can be seen in a new light.

Simply stated, the basic conditions of an econometric model, as used in forecasting, are threefold. (1) The level of some activities depend on the level of other activities in the system. For example, the level of consumption is said to depend, in large part, on the level of income. (2) Some activities are independent of other activities in the economic system. That is, they have their level set by forces outside the system. Insofar as the level of government expenditures is set by Congress, it is an independent variable. (3) The economist, with the help of theory and data, can say something about the stability of the variables. For example, he may feel the relation between income and consumption is fairly stable over time. On the other hand, he may view investment as unstable and subject to change almost at random. These are statements about the nature of the real world.

A woefully simple example will illustrate this point. Suppose we take a simple Keynesian system: (1) Income = Consumption + Investment, (2) Consumption = f (Income) and (3) Investment = autonomous (i.e. set by forces outside the system). Let us further suppose the forecaster feels that, on the basis of historical data, consumption will be .8 of income. This, it is assumed, is a stable relation. Further, suppose that from surveys of intended investment, the level of investment will be at 20. This is the independent variable which is, by assumption, set by forces outside the system postulated. Given the validity of these data we know that the income will be 100.[4] The addition of more equations and unknowns merely serves to elaborate the process and enhance the accuracy of the prediction. We need not fret about this issue. The point involved is that if this setup works and makes sense, then we have stated something about the workings of the economy. Our method of aggregation is useful.

[3] To argue that in order to understand the local economy one must study the demand for its exports is merely carrying the base approach one step further. This is not our concern at this point.

[4] The basic 3 equations: (1) $Y = C + 1$ (2) $C = .8Y$ (3) $I = 20$ reduce to: (4) $Y = .8Y + 20$ by substitution, which yields: (5) $Y = 100$

Let us now turn back to the urban scene and see what this same sort of approach yields as a method of explaining income levels of the urban economy.

The Theory of the Economic Base

The urban economy consists of hundreds of economic units all engaged in the task of creating income. Our problem, as stated above, is to combine these units into meaningful aggregates. The method will be similar to that of the national income forecaster.

First off, let us look at those activities with levels set by forces outside the community. Exports, of course, are the biggest item. The forces which determine the demand for the exports are outside the control of the urban area. But this does not mean all exports are independent. The exports of the City of New York to suburban towns in the form of retail goods may not be true exports. The reason this is so is that the people who buy these retail goods work in New York. Their level of expenditures is dependent on the income they receive from the city. In effect, the city is selling to itself. This is not true in the case of a shopping center where, say, farmers come to buy. Farm income depends upon the demand for farm products, and not upon the income of the shopping center. In the latter case the retail exports are true exports similar to manufactured goods. In the former case they are not. But in general, it is safe to assume most exports are independent of the local community.

To stop here, as most base studies do, would be a mistake. Other income-creating activities in the urban economy are also more or less independent of the level of income. Residential housing, business investment and local government expenditures appear to be largely independent of the level of local income. If they are, then they function in the same capacity as true exports. For a small area these may not be of much importance as a percentage of total basic income, but this is not true for larger areas.

On the other side of base-type division are the non-basic or dependent activities. As usually pointed out, these activities consist largely of local services, retail trade, and professional as well as other services. The assumption is that these activities have their level set by the level of community income.

Now all that the theory of the economic base does is bring these two sets of activities together into an urban multiplier. An over simplified but useful example parallel to our national income example would run as follows: (1) Total urban income = income earned in independent activities + income earned in dependent activities. (2) Income originating in dependent activities = .5 total income. (3) Income originating in dependent activities = 20. In this case the income would be 40. In income terms this implies a basic to non-basic ratio of 1:1. If the function relating dependent activities to total income is constant, an increase of 10 in independent activities will give rise to a total increase of 20 in urban income. This is just a simple form of the well known economic multiplier. It is the arithmetic of the base approach.

In discussing national income forecasting it was pointed out that, in addition to knowing which variables are dependent and independent, something should be said about the stability of the variables. If, in the example of the preceding paragraph, at the same time the basic or independent activities level went up by 10, the function relating dependent or non-basic activities shifted, independently, from .5 to .4, any forecast of future income would be quite a way off. Thus it is important to state something about the stability of the variables.

The study of Alexander on Madison and Oshkosh gives some support to the *a priori* assertion that non-basic to basic ratios are stable.[5] To see this, consider the case of two communities of about the same size and income, located a given distance from the central city. In both communities people possess income and will spend it only on retail goods and services. Our knowledge of the consumers behavior would indicate that these two sets of consumers will spend their money in roughly the same proportions for various retail and service goods.[6] If this is true then it follows that the income flowing to dependent activities will be the same in both communities. Further we would expect the number of employees and firms to be about the same. The ease of entry into retail and service activities, compared with manufacturing, probably accounts for this feature.

[5] John Alexander, "The Basic-Nonbasic Concept of Urban Economic Functions," *Economic Geography*, July 1955, pp. 246-261.

[6] See the recent, Bureau of Labor Statistics, *Family Income, Expenditures and Savings in 1950*, Bulletin No. 1097, June 1953.

This is important. If consumption patterns in the urban economy are stable, as they tend to be for the national economy, then calling some activities dependent or non-basic is useful. Not only do they depend on the level of urban income, but they depend on the level of urban income in a predictable manner. If empirical studies such as Alexander's can support and quantify this thesis, it will be a major step forward in urban research.

Again on *a priori* ground one would look towards the independent activities for sources of instability. Local recessions do not start because of layoffs in the retail sector. Usually it is the manufacturer's business which folds, causing a downturn. Only further studies on the nature of demand for the various independent activities can point up the sources of instability in this area.

In summation, the base is simply a modified form of an old economic concept, the multiplier. Its usefulness is derived from the logic of the assumptions made concerning the behavior of the dependent and independent activities. These are yet to be tested fully by empirical research.

Current Pitfalls in Base Studies

Using the above analysis as a frame of reference, some attention should be given to the current usage of the base concept. Although many items should be discussed, only four will be mentioned.

The definition of basic activities as the exports of goods, services and capital beyond the boundaries of the region can be misleading. If the object of a base study is to show the forces determining the level of income, this concept is too limited in its coverage. This follows from the fact that as the boundaries of a region are expanded, exports become less and less. Yet the boundaries are arbitrary, and the wider they are drawn, the less the amount of exports. For the world as a whole there are no exports, but a great deal of income instability exists. This is the danger of equating exports with the source of instability.

Another problem which comes up is the selection of units by which to measure the economic base.[7] For reasons argued above income may be the best method. But measuring income of a community is a tricky problem both conceptually and statistically. Conceptually the problem arises as to what is meant by income. The simplest measure is "income accruing to residents." This is the value of the income received by the residents from all sources. Except for some minor adjustments it resembles personal income in the national picture. If factor income is used then all sorts of problems come up. How to allocate corporate profits among residents vs. non-residents, rental incomes, and so forth, are problems. It is not safe to take "value added" in production for an urban economy and use it as the urban income analogous to national income. For the national economy, where all factors are owned by the residents, product and charges against product are good measures. The value of a unit of output must be somebody's income. But for a community the value of the output, of a local steel mill for example, need not be income to local people, even if the concept of value added is used.

Thus it seems highly desirable to use income accruing to residents as the measure of urban income. This income can be divided into incomes arising out of dependent and independent activities. In many cases the same individual will have income from both sources. Field surveys are needed to resolve this problem.

Another issue which comes up in base studies is that of secular growth. The concept of the base is essentially a short-run tool of analysis. If the desire is to explain future growth possibilities both in terms of the expansion of existing basic activities as well as the possibility of attracting new industry, then an approach via location theory and the economics of regional development are called for. All the base type of analysis can do is point out what happens *if* you add more independent activities. It cannot say whether or not you will grow in independent activities. The failure of mining towns to attract new industries with the closing of the mines is evidence supporting this thesis. In like manner, the springing up of a retail sector around an atomic energy plant supports the thesis of dependent activities. The city planner interested in the possibilities of new manufacturers moving into a zone set aside for industry would do well to consider

[7] See: Richard Andrews, "Mechanics of the Urban Economic Base," *Land Economics*, February 1954, pp. 51-60; Charles Leven, "An Appropriate Unit for Measuring the Urban Economic Base," *Land Economics*, November 1954, November 1954, pp. 369-71.

location theory and forget, in this instance, the economic base approach.

A final word may be in order about urban economic studies in general. The researcher may try to study everything about a community. This usually turns out to be an impossible task. Generally some logical framework is needed. The base approach is a framework. But unless this base approach is modified along the lines suggested above, it may not be too useful. Economics has a theory of the multiplier, both domestic and international, as well as a system of national income accounts. In modified form these can be of invaluable aid as tools of research in helping to understand the urban economy.

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Book Reviews

Housing Taxation. By Walter A. Morton. Madison, Wisconsin: University of Wisconsin Press, 1955. pp. 280. $4.75.

This study of the part of the property tax levied against houses is based, essentially, on a statistical analysis financed by the Works Progress Administration in which Wisconsin income tax returns within several Wisconsin communities were used to show the relation of property taxes on owned homes to income. The author has placed the results of these studies in a setting in which he analyzes the incidence of the tax, considers its regressivity, compares it with the sales tax, and makes a policy suggestion.

The appendix is devoted to the results of the statistical study. In general, a degree of regressivity (to reported income) is shown at least as great as in other studies and much greater than in some.[1]

The incidence accompanying these impacts is discussed, of course, as raising questions of (one) the possible capitalization of some of the tax on land and (two) as possible shifting of the tax on reproducible goods. It is shown that, whether capitalized or not, the tax on land affects the progressivity or regressivity of the tax very little. The author finds it difficult to believe that in previous sales all future taxes were correctly capitalized in purchase prices and thus that the lower past purchase prices were always exactly enough to affect the burden of the current property tax on land. In our quaint literature this assumed balancing of present burden with past savings is, according to the author, sometimes said to make the tax burdenless. He rejects this idea but leaves open the possibility that the tax is less of a deterrent to work, saving and investment than taxes on income from these.

As for the tax on reproducible property, the author notes the usual lack of data on price elasticities, but does not comment on Deusenberry's and Maisel's recent contribution in this connection.[2] The author accomplishes a readable estimate of incidence, using static theory, aggregate demand theory, and a combination of these. The conclusions are not greatly different from those of the Hicks.[3] The author disposes neatly of the issues of possible backward shifting which are raised by Harry Gunnison Brown, making points which may be relevant also to more recent arguments similar to Browns'.

With the conclusion that incidence rests chiefly with tenant and landlord, the incidence of the taxes on owner-occupied homes remains on the occupants, in one way or another, and in a regressive pattern. What is worse for those of low income, housing space is subject to decreasing cost, and therefore, as the author shows, the income elasticity of demand for housing amenities is greater than the income elasticity of housing, and the low income groups are more heavily burdened, relative to the impacts shown in the statistical studies than the high-income groups.

The author presents data and arguments indicating that the property tax on housing is more regressive, even as mere impact, than sales taxes, whether or not food sales are taxed. Other alternative taxes are not extensively examined.

The chief policy suggestion is inspired by the homestead exemption but attempts to avoid its dangers: an exemption of a certain amount per dwelling of any kind is proposed. Throughout the study it is emphasized that the property tax is an "institutional" or "strategic" factor, in the sense that it is not an inherent cost of housing. Among the research questions suggested by the book a number would appear to surround the notion that the property tax is "strategic." While

[1] Compare Jesse Burkhead, "Property Taxes as a Burden on Shelter," *Journal of Land & Public Utility Economics*, August 1944.

[2] Sherman Maisel, *Homebuilding in Transition* (Berkeley: University of California Press, 1953); J. Deusenberry, "The Role of Demand in the Economic Structure," in Leontief and others, *Studies in the Structure of the American Economy*, 1953.

[3] J. R. and Ursula K. Hicks, *The Incidence of Local Rates in Great Britain* (Cambridge, England: 1945).

recent research would be of help at several of the author's key points, conditions for modification of the property tax, and its actual functions, have been largely neglected by the researchers. Here there is a fertile field to be plowed.

GEORGE DUGGAR

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The Agricultural Regions of the United States. By Ladd Haystead and Gilbert C. Fite. University of Oklahoma Press, Norman. 1955. pp. xx, 288. $4.00.

This book tells the fascinating story of present-day American agriculture, region by region. The stated aim of the authors is to provide "a tool for students, county agricultural agents, teachers of vocational agriculture, businessmen, and all others interested . . . ." in the varied agricultural production of the United States. While the authors are concerned with "the economic and geographic factors that make our agriculture what it is," they also appropriately consider the emotional factor as a vital thing in our agricultural economy.

The first chapter explodes the myth of a "typical" American farm and provides a fine raison d'etre for a regional approach to American agriculture. Then a shotgun blast of interesting and significant facts about each region is aimed at the reader in order to awaken in him a greater appreciation of the many contrasts in our Nation's agriculture.

Yet there is something about each region which is pointed out as a unifying characteristic that justifies separating that region from another agriculturally. Chapter titles highlight these distinctions—"New England: Land of Abandonment," "The Middle Atlantic States: Prime Market," "Delmarva: Intensive Region," "The Middle South: Reorganizing Belt," "The Deep South: The Shifting Cotton Belt," "The Corn-Soy Belt: Feedbag of Democracy," "The North North-Central Region: Dairyland," "The Western Prairies and High Plains: American Granary," "The Southwest: Far Distances and Dry Skies," "The Rocky Mountain States: A Farm in the Sky," and "The Western Slope: Land of Tomorrow."

Serious students of agricultural economics or geography will look for several things about agricultural regions which are not to be found in this book. The regionalization is a superficial one. It divides regions along state boundaries and places Texas, New Mexico, and Oklahoma in more than one region without a satisfactory explanation. This overlapping generalization serves to eliminate the problem of drawing regional boundaries, but is hardly appropriate for a book dealing with agricultural regions.

Frequent reference is made to the importance of physical conditions in a regionalization of agriculture, but critical differences need more attention. Neither climate nor topography is accorded sufficient attention in terms of the contribution that these two conditions make toward distinguishing one region from another. Climate is omitted entirely in the graphic presentation.

On the whole the graphic and photographic presentation is very good, although generally the figures are not adequately related to the text. Brief thought-provoking captions would have added much to the book's worth.

Appropriately the authors conclude with a strong emphasis of the many changes occurring in mid-century American agriculture. The necessity of understanding these changes if a successful farm program is to be developed is also stressed.

JAMES R. ANDERSON

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Marginal Cost Price-Output Control. By Burnham Putnam Beckwith. New York: Columbia University Press, 1955, 283 pp., $5.75.

The extensive consideration which has been given to the marginal cost pricing proposal by writers in the fields of welfare economics and public utilities in recent years makes the appearance of the first book-length treatise on this subject an event of considerable interest. The scope of the volume is indicated by its sub-title: A Critical History and Restatement of the Theory. In Part I the author reviews in some detail the treatment of marginal cost pricing by about fifty writers. Credit for first stating the basic idea of marginal cost pricing is given not, as has

commonly been the case, to Jules Dupuit but to a German economist, Wilhelm Launhardt, who is said to have recognized the principle in a treatise on railway rates published in 1885. The author concludes that "two Socialist economists, Meade and Lerner, were the first to state the theory of marginal-cost output control with reasonable completeness and clarity" in 1936 and 1937. (p. 78) He finds that as of 1950 the theory was accepted by a majority of non-Marxian, English-speaking Socialist economists and by a handful of public utility economists but by few others. That the theory has not been more widely accepted is attributed to the fact that "orthodox economists consciously or unconsciously wish or feel compelled to apologize for the performance of Capitalism and to ignore or attack potential arguments in favor of Socialism. Recognition of the obvious fact that prices ought to equal marginal cost has been slow to develop because this ideal can be more fully and more easily achieved under Socialism than under Capitalism." (p. 12)

Beckwith finds the treatment of marginal cost pricing by each of the writers reviewed in Part I to be deficient in some respect and in Part II undertakes to restate the theory in what he believes to be the correct form. First, he explicitly recognizes that the equating of price with marginal cost can be achieved either by direct price control or by direct output control and explains the circumstances under which each of these approaches should be adopted. The author says that earlier writers had generally used one or the other of these approaches without recognizing that there was an alternative and sometimes did not make clear which approach they were using. Second, Beckwith undertakes to redefine marginal cost and to separate what he calls the price-output problem (marginal analysis) from the fixed investment problem (total analysis). He regards this as his most important contribution. Marginal cost is defined as the "sum of all socially necessary variable money costs incurred to produce the marginal unit at the intensive margin." (p. 18) Two features of this definition should be noted. First, the words "socially necessary" exclude advertising and otner costs regarded by Beckwith as non-essential. Second, the reference to costs at the intensive margin is intended to emphasize that marginal cost is a strictly short run concept. According to the author, "long run marginal cost is a self-contradictory concept" (p. 14) and "the concept of long run price is extremely vague if not meaningless." (p. 15) Space does not permit the analysis which these sweeping propositions warrant. Suffice it to say that the reviewer agrees that there may be a tendency to forget that smooth long-run cost curves are a simplification of reality and that the idea of an "average marginal cost" is inappropriate; on the other hand, he is not convinced that the mere existence of cost discontinuities invalidates the concept of long-run marginal cost, much less long-run analysis in general, or that marginal cost pricing can be evaluated in isolation from the problem of optimum investment.

It is the reviewer's impression that the author was intent on making a case for marginal cost pricing and thereby for socialism. A balanced, scientific appraisal of marginal cost pricing would require more extended consideration of the theoretical and practical objections which have been raised against this proposal than is contained in this work. However, the review of the literature in Part I and the extensive bibliography will be useful to students in this field.

ROBERT W. HARBESON
University of Illinois

Urban Planning Education. By Frederick J. Adams. Cincinnati, Ohio: The Alfred Bettman Foundation, 1954, pp. 57.

Probably no more curious lag in the training of specialists exists today than in the field of urban planning education. Training for the public service in the United States is not too tempting to prospective students as it is. The training of planners suffers accordingly. The problem is not that there is not a demand. On the contrary, all evidence points to a great scarcity of trained technicians in the broad field of planning: city, metropolitan, county, regional, urban renewal, and others. Monthly job listings published by the American Society of Planning Officials and the American Institute of Planners confirm this.

Professor Adams limited his report to a review of (undergraduate and graduate) professional training of urban planners in the colleges and universities of the United States.

It is a concise, factual summary highlighting the content of curricula, methods used, enrollment, and differences between the various schools, 21 in number, at the time of the preparation of the report. In a precise and well stated series of recommendations, Professor Adams emphasizes the need for special training programs and the need for increased enrollment.

The report deals primarily with urban planning education and not with problems connected with the other types of planning I have mentioned above. However, despite the self-imposed limits on the survey, this report should be studied carefully by all readers of *Land Economics* for the obvious reason that sound action programs in the field of urban economics and land development will be limited for a number of years to come by the scarcity of planning technicians being trained in our colleges. Planning education is a complex subject involving a wide variety of disciplines. While theoretically there may be a sufficient number of planning schools, the number of students within each school is so few and the spread of competency seems to be so limited that we can only consider the training of planners today as being in its infancy. If planning were only an academic subject or a theoretic social science the problem would not be so serious. But here we have a discipline combining the social sciences theory, a wide variety of technological sciences including physical land analyses and programming and the practice of public service. Unquestionably, one of the limiting factors on enrollment in the planning schools is the fear of the public service on the part of the student. The public service at any level of government involves the bugaboo of politics; and politics, a distressing word even in a democracy which can be only politically run, seems to be something to be shunned rather than to be understood and in a sense enjoyed.

Since planning at all levels of government involves political action, a highly specialized type of student, of school and of educational objectives are needed. Therefore, one of the larger factors to be called into play in education of planners is the qualifications of the candidates for planning degrees. The reader of Professor Adams' report will find in the appendices interesting results of questionnaires sent to both graduates and to employers of graduate planners covering the questions of satisfactions with existing training programs and the results thereof.

Land economics and taxation problems are considered by the Adams' report a part of the social science requirements in any curriculum irrespective of the derivation of the student (whether from schools of architecture, legal science, law, or any other). It is not clear from the report as to whether or not adequate training programs in the field of land economics are available in the universities where planning education is at present developing. Nor is it clear as to whether or not students in public administration, economics, and land economics may avail themselves of the opportunity of taking planning courses for credit in the same institutions. The report does not break out the question of planning training for students of public administration and economics in institutions where no formal planning training is under way. The Adams' report could not go into this kind of detail. However, it is important that these matters be seriously considered by all of those concerned with broadening the scope of the planning field to provide for sounder programs of land economics and taxation in this country.

We therefore cannot consider this report as definitive. It marks on the calendar of education a moment in the history of the development of a new science or perhaps better—a new scientific method directed towards urban order. What is needed is continuing current reporting on this subject and on planning education of a broader nature. We also need a sense of direction which can only come from such analysis. At present the situation could be termed "deficient."

CARL FEISS

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A Theory of Economic-Demographic Development. By Harvey Leibenstein. Princeton, New Jersey: Princeton University Press 1954. pp. xi, 204. $4.00.

Both academicians and persons concerned with the economic aspects of the overpopulated and underdeveloped areas of the world will find this book a refreshing ap-

proach to the problem. It is the first book of its kind to deal with this vital question.

The author uses a theoretical approach, a model tied to reality in that it specifies variables that can be studied empirically. Using progressively enriched, but still highly simplified models, he examines some of the characteristics of the static and dynamic interplay of economic, sociological and demographic forces in situations in which both fertility and mortality are very high.

Up to the time of this book, the study of the interaction between such variables and their varying importance in a time sequence was largely a neglected field compared to work done in other aspects of social sciences, probably because the problem is interdisciplinary in nature. In his theoretical analysis the author successfully has gone beyond the conventional bounds of any given discipline. This should harken the wary and the skeptical.

The major theoretical features of the book are: (1) an outline of the conditions of underdevelopment equilibrium; (2) the elaboration of dynamic models which permit determination of the conditions of economic growth and the magnitudes of the controlling factors necessary to break the Malthusian trap; and (3) an integration of sociological factors with economic-demographic theories.

The central problem underlying much of the study is the exploring of conditions which are necessary in order to achieve a transition from what may be characterized as Malthusian to non-Malthusian conditions. The sequence of chapters follows from the more aggregative to the less aggregative models, and from the more restrictive to the less restrictive hypotheses. Thus, first is presented, discussed and evaluated a static Malthusian model; secondly, a simple macro-dynamic model; thirdly, consideration is given to the elements of a multi-sector model; and lastly, the relationships between the less and the more aggregative models are treated.

The author outlines and evaluates some of the prevailing optimum population theories and suggests the rough outline of one of his own. In this connection he has formulated a number of propositions for further testing and has in general set a benchmark which spells out some of the conditions necessary for the destabilization of the Malthusian equilibrium.

The author has written on a complex subject logically and clearly. He has supported his analysis and model construction with a sprinkling of mathematical arguments of an elementary algebraic form. However, this should not discourage the non-mathematically minded reader. Economists, sociologists and demographers alike will find this book stimulating and of much interest.

PAUL J. JEHLIK

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Transportation in the Wisconsin Economy. By William H. Dodge. Madison, Wisconsin: Bureau of Business Research and Service, Wisconsin Commerce Reports, Volume IV, Bulletin 4, 1955, pp. 103. $1.15.

This is a descriptive study of transportation facilities and the pattern of freight traffic in the Wisconsin economy. The first of the three parts which comprise this study is devoted to Wisconsin's economic and locational structure. The state economy is shown to be relatively well balanced but located on the northwest fringe of the national industry-population center and in a north central position relative to the major agricultural region of the nation. As a result, Wisconsin allegedly suffers a comparative locational disadvantage insofar as its access to regional and national markets is concerned. In order to measure the location factor as it relates to the Wisconsin economy, the author employs mileage and population data to calculate indexes of market accessibility. Population-weighted mileages are used to measure the accessibility of consumer markets. Mileages weighted respectively by manufacturing employment and gross farm income measure the accessibility of industrial and agricultural markets.

Among the fourteen leading manufacturing states and two neighboring states to the west, Wisconsin is found to rank sixth in relative access to the national consumer market, seventh in relative access to the national industrial market, and fifth in relative access to the national agricultural mar-

ket. That the usefulness of such broad measurements may be doubted seems to be confirmed subsequently in a brief analysis of comparative railroad freight charges which appears, for reasons unexplained, in the chapter on transportation facilities. Carload waybill statistics covering six commodity classes which make up a significant share of Wisconsin's carload shipments of manufactured commodities were selected for a comparison of Wisconsin freight charges with those of competing states. Freight charges on Wisconsin shipments, as against those incurred by competing suppliers in reaching principal market states, were such as to dispel considerably the earlier impression of locational disadvantage.

The pattern of Wisconsin freight traffic, the second part of this study, examines both traffic density and composition by type of carrier. The latter study, in addition, breaks down the data presented into three major commodity groupings.

The concluding section is devoted to Wisconsin's transportation system. After surveying the historical development of the state's transport facilities, each of the principal means of transportation is considered on the basis of facilities currently employed and the cities served with some attention given to schedules, service and performance. Throughout this work statistics and maps are used abundantly and effectively.

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Among Articles to Appear in May 1956 Issue are:

Real Property Assessment-Sales Ratios and the Citizens Research Council of Michigan.....JAMES K. HALL

The Forest Economy of the Pacific Northwest.....WALTER J. MEAD

Locational Aspects of Economic Development.....JOHN R. P. FRIEDMANN

Communal Farming in Israel.....JOSEPH SHATIL

Prospective Population Growth, Howard County, Indiana.....PHILIP SUNDAL

Ownership and Use of Forest Land in Northwestern California.....ADON POLI

Publications Received

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Letters to An American Farmer. By Urban J. Baer. Des Moines, Iowa: National Catholic Rural Life Conference, 1955, p. 117, $2.00.

Can We Solve the Farm Problem? By Murray R. Benedict. New York: The Twentieth Century Fund, 1955, pp. 480, appen., $5.00.

Approaches to Economic Development. (Our stake in the undeveloped areas is political as well as economic and humanitarian.) By Norman S. Buchanan and Howard S. Ellis. New York: The Twentieth Century Fund, 1955, pp. 454, $5.00.

Moving People in Metropolitan Areas. (Proceedings of the Second Annual University of California Conference on City and Regional Planning, 1954) Berkeley, California: University of California Press, 1955, pp. 35, 75c.

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Economic Survey of Europe in 1954. (Includes Studies of Regional Problems in European Countries and The Structure of the French Economy.) Prepared by the Research and Planning Division, Economic Commission for Europe, United Nations. Sales Agent, Columbia University Press, New York 27, New York, 1955, pp. 195, plus appen., $2.50.

Economic Survey of Latin America 1954. (Prepared by the Secretariat of the Economic Commission for Latin America, United Nations.) Sales Agent, Columbia University Press, New York 27, New York, 1955, pp. 203, $2.50.

Crowded Streets Subject of Urban Land Study

A new technical bulletin, titled *Crowded Streets*—A Symposium on Public Transportation, has just been published by the Urban Land Institute of Washington, D. C., an independent research agency in urban planning and development. The 77-page publication contains eight studies of transportation problems in representative American cities ranging in size from Youngstown to Los Angeles.

Although public transit is clearly the most efficient method of moving large numbers of people into and out of high density districts, urban transportation has been steadily losing patronage, the Institute points out. The eight studies of public transportation in such cities as Richmond, Cleveland, Kansas City, St. Louis and Washington, D. C. are packed with ideas on how to arrest this trend and sell the public on making greater use of existing public transportation instead of using private automobiles to enter the downtown business district.

One proposal suggests the challenging theory that a transit company be authorized to collect a minimum charge simply for making its services available just as do gas and telephone companies and other utilities. The subsidy is proposed on the premise that a community should pay a minimum fee for the availability of public transportation because such transportation is vital to the total economy of the community.

Other suggestions offered are an increase in express bus service to downtown areas; suspended monorail transit systems; and such special-purpose operations as opera expresses, ball-game shuttles and park-ride services. Several of the articles in the technical bulletin stress the importance of preferential traffic regulations for transit vehicles and the setting aside of certain streets solely for transit use during rush hours.

The Urban Land Institute believes that wider use of the transit systems will relieve downtown traffic congestion without the necessity of spending large sums for construction of freeways, widening of streets, or building costly off-street parking facilities. The money saved, ULI points out, can be used for the "much neglected work of conserving and redeveloping downtown areas."

Crowded Streets emphasizes that the preservation of central business districts is involved in the challenge of bringing public transit back into favor. The bulletin shows that different cities have varying concepts of a transit operation's role in the life of a community.

(*Crowded Streets*, Technical Bulletin No. 26 is for sale by the Urban Land Institute, 1737 K Street, N. W., Washington, D. C. at a price of $4.00 a copy.)

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Review of Books, Titles of New Books, Periodicals, Notes

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